Technical Information 13

As technology becomes more complex, specifying wire and cable products to meet system performance demands becomes more time consuming and complex.

Today's system designer must be aware not only of the general transmission line types but also of the myriad of materials available to meet specific environmental or electrical performance criteria.

This technical section is presented to aid in the selection of materials and designs which will best suit the combination of hardware and transmission media.

For technical questions regarding specific transmission designs or applications, please contact BICCGeneral's Engineering Department.

Insulation & Jacket Properties

TYPICAL PROPERTIES OF COMMON INSULATING MATERIALS

PARAMETER	PVC	PE	PP	XLPE	NYLON	FEP	TFE	BUTYL RUBBER	SILICONE RUBBER	TPR
Specific Gravity	1.37	0.92	.89	0.93-1.18	1.09	2.16	2.17	1.40	1.24	1.16-1.20
Dielectric Constant (a) 60 Hz (b) 1000 Hz	 6.0 5.0	 2.26 2.26	 2.6	 3.0 3.0	 4.6 4.5	 2.15 2.15	 2.1 2.1	 4.1 4.0	 3.3 3.1	 2.8 2.8
Dielectric Strength, v/mil (a) 0.010" wall (b) 0.040" wall	 1800 800	 2100 1050	 850 450	 – 700	 1000 470	 2000 950	 2000 950	 700 500	 600 400	 625
Tensile Strength, PSI x 1000	1.5-3.8	1.4-2.4	2.9-4.5	1.8-2.5	8.8-11.9	2.3-3.1	2.0-6.0	0.5-1.5	0.6-1.2	2.3
Service Temp, Range, °C	–55/+105	–90/+90	–40/+105	–80/+75	–55/+105	–90/+200	–90/+260	–40/+90	–80/+200	–55/+90
Elongation, %	200-375	350-550	700	250-400	150-380	200-330	200-500	200-400	125-400	500
Water Absorption, % in 24 hr	<0.75	<0.02	<0.02	<0.01	2.5	<0.01	<0.01	<1.0	<1.0	<0.6
Flame Resistance	Self Extinguishing	Supports Flame	Supports Flame	Slow Flame	Self Extinguishing	Non-Flammable	Non-Flammable	Slow Burning	Slow (Non-Cond. Ash)	Flammable
Ozone Resistance	Excellent	Good	Excellent	Good	Good	Excellent	Excellent	Excellent	Excellent	Excellent
Flexibility	Good	Good	Good	Good-Fair	Good-Fair	Good	Good	Excellent	Excellent	Excellent
Abrasion Resistance	Good	Good	Fair	Excellent	Excellent	Excellent	Excellent	Poor	Poor	Good-Fair
Acid Resistance	Excellent	Excellent	Excellent	Excellent	Excellent	Poor	Excellent	Excellent	Good	Excellent
Base Resistance	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Good	Good	Excellent
Hydraulic Fluid Resistance	Good-Fair	Fair-Poor	Fair	Good-Fair	Good-Fair	Excellent	Excellent	Poor	Fair-Poor	Poor
Organic Solvent Resistance	Fair-Poor	Poor	Fair	Fair	Good-Fair	Excellent	Excellent	Good-Fair	Poor	Poor

NOTE: The above is representative of performance. For specific compound performance, consult Customer Service

TYPICAL PROPERTIES OF COMMON JACKETING MATERIALS

PARAMETER	PVC	PE	NYLON	FEP	TFE	SILICONE RUBBER	NEOPRENE	POLY-URETHANE	TPR
Specific Gravity	1.37	0.92	1.09	2.16	2.17	1.24	1.52	1.3	1.16-1.20
Tensile Strength, PSI x 1000	1.5-3.8	1.4-2.4	8.8-11.9	2.3-3.1	2.0-6.0	0.6-1.2	2.5-4.0	>3.5	2.3
Elongation, %	200-375	350-550	150-380	200-330	200-500	125-400	300-500	540-700	500
Service Temp, Range, °C	–55/+105	–80/+75	–55/+105	–90/+200	–90/+200	–80/+200	–65/+90	–65/+75	–55/+90
Ozone Resistance	Excellent	Good	Good	Excellent	Excellent	Excellent	Excellent	Good	Excellent
Weatherability	Good-Fair	Excellent Good	Fair-Poor	Excellent	Excellent	Excellent	Good	Good	Excellent
Flame Resistance	Self Extinguishing	Supports Flame	Flammable	Non-Flammable	Non-Flammable	Slow-Burn (Non-Cond. Ash)	Self-Extinguishing	Slow Burn	Flammable
Flexibility	Good	Good	Good-Fair	Good	Good	Excellent	Excellent	Excellent	Excellent
Abrasion Resistance	Good	Good	Excellent	Excellent	Excellent	Poor	Excellent	Excellent	Good-Fair
Acid Resistance	Excellent	Excellent	Poor	Excellent	Excellent	Poor	Good	Fair	Excellent
Base Resistance	Excellent	Excellent	Excellent	Excellent	Excellent	Good	Good	Fair	Excellent
Hydraulic Fluid Resistance	Good-Fair	Fair-Poor	Good-Fair	Excellent	Excellent	Fair-Poor	Good	Poor	Good
Organic Solvent Resistance	Fair-Poor	Poor	Good-Fair	Excellent	Excellent	Poor	Good	Poor	Poor
Resistance to Tearing	Good	Good	Excellent	Good	Good	Fair	Good	Excellent	Good-Fair

NOTE: The above is representative of performance. For specific compound performance, consult Customer Service

Decimal Conversion Factors

FRACTIONS, DECIMALS & MILLIMETER CONVERSION CHART

FRACTIONS OF AN INCH						EQUIVALENTS	
64	32	16	8	4	2	DECIMAL	mm
1						0.016	0.40
2	1					0.031	0.79
3						0.047	1.19
4	2	1				0.063	1.59
5						0.078	1.98
6	3					0.094	2.38
7						0.109	2.78
8	4	2	1			0.125	3.18
9						0.141	3.57
10	5					0.156	3.97
11						0.172	4.37
12	6	3				0.188	4.76
13						0.203	5.16
14	7					0.219	5.56
15						0.234	5.95
16	8	4	2	1		0.250	6.35
17						0.266	6.75
18	9					0.281	7.14
19						0.297	7.54
20	10	5				0.313	7.94
21						0.328	8.33
22	11					0.344	8.73
23						0.359	9.13
24	12	6	3			0.375	9.53
25						0.391	9.92
26	13					0.406	10.32
27						0.422	10.72
28	14	7				0.438	11.11
29						0.453	11.51
30	15					0.469	11.91
31						0.484	12.30
32	16	8	4	2	1	0.500	12.70

FRACTIONS OF AN INCH						EQUIVALENTS	
64	32	16	8	4	2	DECIMAL	mm
33						0.516	13.10
34	17					0.531	13.49
35						0.547	13.89
36	18	9				0.563	14.29
37						0.578	14.68
38	19					0.594	15.08
39						0.609	15.48
40	20	10	5			0.625	15.88
41						0.641	16.27
42	21					0.656	16.67
43						0.672	17.07
44	22	11				0.688	17.46
45						0.703	17.86
46	23					0.719	18.26
47						0.734	18.65
48	24	12	6	3		0.750	19.05
49						0.766	19.45
50	25					0.781	19.84
51						0.797	20.24
52	26	13				0.813	20.64
53						0.828	21.03
54	27					0.844	21.43
55						0.859	21.83
56	28	14	7			0.875	22.23
57						0.891	22.62
58	29					0.906	23.02
59						0.922	23.42
60	30	15				0.938	23.81
61						0.953	24.21
62	31					0.969	24.61
63						0.984	25.00
64	32	16	8	4	2	1.000	25.40

Unit Conversion Factors

CONVERSION FACTORS

UNIT	X	CONSTANT	=	UNIT
Btu		778.0		foot-pound (ft-lb)
Btu		1054.8		joules
Btu		0.293		watt-hours (w-hr)
centimeters (cm)		0.032808		feet (ft)
centimeters (cm)		0.3937		inches (in)
centimeters (cm)		0.00001		kilometers (km)
centimeters (cm)		0.010		meters (m)
centimeters (cm)		10.0		millimeters (mm)
circular mils		0.00064516		circular millimeters
circular mils		0.0000007854		inches^2 (in^2)
circular mils		0.00050671		square millimeters (mm^2)
circular mils		0.7854		mils^2
cubic centimeter (cm^3)		0.000035314		cubic foot (ft^3)
cubic centimeter (cm^3)		0.061023		cubic inch (in^3)
cubic centimeter (cm^3)		0.000001		cubic meter (m^3)
cubic centimeter (cm^3)		0.00026417		gallons
cubic foot (ft^3)		1728.0		cubic in (in^3)
cubic foot (ft^3)		28317.016		cubic centimeter (cm^3)
cubic inch (in^3)		0.00057870		cubic feet (ft^3)
cubic inch (in^3)		0.000016387		cubic meter (m^3)
cubic inch (in^3)		16.387162		cubic centimeter (cm^3)
cubic meter (m^3)		1000000.0		centimeter (cm)
cubic meter (m^3)		35.314456		cubic foot (ft^3)
cubic meter (m^3)		264.17		gallons
feet (ft)		0.00018939		miles
feet (ft)		0.33333		yards (yd)
feet (ft)		12		inches (in)
feet (ft)		0.00030480		kilometer (km)
feet (ft)		0.30480		meters (m)
feet (ft)		30.480		centimeters (cm)
feet (ft)		304.80		millimeters (mm)
feet/pound (ft/lb)		0.00067197		meters/grams (m/g)
foot-pound (ft-lb)		0.001285		Btu
foot-pound (ft-lb)		1.356		joules
foot-pound (ft-lb)		0.1383		kilogram/meter (kg/m)

UNIT	X	CONSTANT	=	UNIT
gallons		3.785332		liters (l))
gallons		0.13368		cubic foot (ft^3)
gallons		231.0		cubic in. (in^3)
gallons		3785.332		cubic centimeter (cm^3)
grams (g)		15.432		grains
gram/centimeter^3 (gm/cm^3)		0.0361275		pounds/in^3 (lb/m^3)
horsepower (hp)		33000.0		ft-lb/min
horsepower (hp)		550.0		ft-lb/sec
horsepower (hp)		745.7		watts (w)
inch (in)		0.027178		yards (yd)
inch (in)		0.083333		feet (ft)
inch (in)		0.00002540		kilometer (km)
inch (in)		0.025400		meter (m)
inch (in)		2.54000514		centimeter (cm)
inch (in)		25.4000514		millimeter (mm)
inch (in)		1000.0		mils
joules		0.000948		Btu
joules		10^7		ergs
liters (l)		61.0250		cubic inch (in^3)
meters (m)		1.093611		yard (yd)
meters (m)		3.2808333		feet (ft)
meters (m)		39.37		inch (in)
meters (m)		100.0		centimeter (cm)
miles		1760.0		yards (yd)
miles		5280.0		feet (ft)
miles		1.6093		kilometer (km)
millimeters (mm)		0.0032808		feet (ft)
millimeters (mm)		0.03937		inch (in)
millimeters (mm)		0.001		meters (m)
millimeters (mm)		0.01		centimeters (cm)
millimeters (mm)		39.3701		mils
millimeters (mm)		1000.0		microns (µ)
watts (w)		44.25		ft-lb/minute
watts (w)		0.737562		ft-lb/sec
watts (w)		0.001341		horsepower
watt-hours (w-hr)		3.41266		Btu

Temperature Conversion Chart

To use this chart, find your known temperature (°F) in the shaded column.

°C	°F	°C	°F	°C	°F	°C	°F	°C	°F
-45.0	**-49.0**	-17.2	**1.0**	10.6	**51.0**	38.3	**101.0**	66.1	**151.0**
-44.4	**-48.0**	-16.7	**2.0**	11.1	**52.0**	38.9	**102.0**	66.7	**152.0**
-43.9	**-47.0**	-16.1	**3.0**	11.7	**53.0**	39.4	**103.0**	67.2	**153.0**
-43.3	**-46.0**	-15.6	**4.0**	12.2	**54.0**	40.0	**104.0**	67.8	**154.0**
-42.8	**-45.0**	-15.0	**5.0**	12.8	**55.0**	40.6	**105.0**	68.3	**155.0**
-42.2	**-44.0**	-14.4	**6.0**	13.3	**56.0**	41.1	**106.0**	68.9	**156.0**
-41.7	**-43.0**	-13.9	**7.0**	13.9	**57.0**	41.7	**107.0**	69.4	**157.0**
-41.1	**-42.0**	-13.3	**8.0**	14.4	**58.0**	42.2	**108.0**	70.0	**158.0**
-40.6	**-41.0**	-12.8	**9.0**	15.0	**59.0**	42.8	**109.0**	70.6	**159.0**
-40.0	**-40.0**	-12.2	**10.0**	15.6	**60.0**	43.3	**110.0**	71.1	**160.0**
-39.4	**-39.0**	-11.7	**11.0**	16.1	**61.0**	43.9	**111.0**	71.7	**161.0**
-38.9	**-38.0**	-11.1	**12.0**	16.7	**62.0**	44.4	**112.0**	72.2	**162.0**
-38.3	**-37.0**	-10.6	**13.0**	17.2	**63.0**	45.0	**113.0**	72.8	**163.0**
-37.8	**-36.0**	-10.0	**14.0**	17.8	**64.0**	45.6	**114.0**	73.3	**164.0**
-37.2	**-35.0**	-9.4	**15.0**	18.3	**65.0**	46.1	**115.0**	73.9	**165.0**
-36.7	**-34.0**	-8.9	**16.0**	18.9	**66.0**	46.7	**116.0**	74.4	**166.0**
-36.1	**-33.0**	-8.3	**17.0**	19.4	**67.0**	47.2	**117.0**	75.0	**167.0**
-35.6	**-32.0**	-7.8	**18.0**	20.0	**68.0**	47.8	**118.0**	75.6	**168.0**
-35.0	**-31.0**	-7.2	**19.0**	20.6	**69.0**	48.3	**119.0**	76.1	**169.0**
-34.4	**-30.0**	-6.7	**20.0**	21.1	**70.0**	48.9	**120.0**	76.7	**170.0**
-33.9	**-29.0**	-6.1	**21.0**	21.7	**71.0**	49.4	**121.0**	77.2	**171.0**
-33.3	**-28.0**	-5.6	**22.0**	22.2	**72.0**	50.0	**122.0**	77.8	**172.0**
-32.8	**-27.0**	-5.0	**23.0**	22.8	**73.0**	50.6	**123.0**	78.3	**173.0**
-32.2	**-26.0**	-4.4	**24.0**	23.3	**74.0**	51.1	**124.0**	78.9	**174.0**
-31.7	**-25.0**	-3.9	**25.0**	23.9	**75.0**	51.7	**125.0**	79.4	**175.0**
-31.1	**-24.0**	-3.3	**26.0**	24.4	**76.0**	52.2	**126.0**	80.0	**176.0**
-30.6	**-23.0**	-2.8	**27.0**	25.0	**77.0**	52.8	**127.0**	80.6	**177.0**
-30.0	**-22.0**	-2.2	**28.0**	25.6	**78.0**	53.3	**128.0**	81.1	**178.0**
-29.4	**-21.0**	-1.7	**29.0**	26.1	**79.0**	53.9	**129.0**	81.7	**179.0**
-28.9	**-20.0**	-1.1	**30.0**	26.7	**80.0**	54.4	**130.0**	82.2	**180.0**
-28.3	**-19.0**	-0.6	**31.0**	27.2	**81.0**	55.0	**131.0**	82.8	**181.0**
-27.8	**-18.0**	0.0	**32.0**	27.8	**82.0**	55.6	**132.0**	83.3	**182.0**
-27.2	**-17.0**	0.6	**33.0**	28.3	**83.0**	56.1	**133.0**	83.9	**183.0**
-26.7	**-16.0**	1.1	**34.0**	28.9	**84.0**	56.7	**134.0**	84.4	**184.0**
-26.1	**-15.0**	1.7	**35.0**	29.4	**85.0**	57.2	**135.0**	85.0	**185.0**
-25.6	**-14.0**	2.2	**36.0**	30.0	**86.0**	57.8	**136.0**	85.6	**186.0**
-25.0	**-13.0**	2.8	**37.0**	30.6	**87.0**	58.3	**137.0**	86.1	**187.0**
-24.4	**-12.0**	3.3	**38.0**	31.1	**88.0**	58.9	**138.0**	86.7	**188.0**
-23.9	**-11.0**	3.9	**39.0**	31.7	**89.0**	59.4	**139.0**	87.2	**189.0**
-23.3	**-10.0**	4.4	**40.0**	32.2	**90.0**	60.0	**140.0**	87.8	**190.0**
-22.8	**-9.0**	5.0	**41.0**	32.8	**91.0**	60.6	**141.0**	88.3	**191.0**
-22.2	**-8.0**	5.6	**42.0**	33.3	**92.0**	61.1	**142.0**	88.9	**192.0**
-21.7	**-7.0**	6.1	**43.0**	33.9	**93.0**	61.7	**143.0**	89.4	**193.0**
-21.1	**-6.0**	6.7	**44.0**	34.4	**94.0**	62.2	**144.0**	90.0	**194.0**
-20.6	**-5.0**	7.2	**45.0**	35.0	**95.0**	62.8	**145.0**	90.6	**195.0**
-20.0	**-4.0**	7.8	**46.0**	35.6	**96.0**	63.3	**146.0**	91.1	**196.0**
-19.4	**-3.0**	8.3	**47.0**	36.1	**97.0**	63.9	**147.0**	91.7	**197.0**
-18.9	**-2.0**	8.9	**48.0**	36.7	**98.0**	64.4	**148.0**	92.2	**198.0**
-18.3	**-1.0**	9.4	**49.0**	37.2	**99.0**	65.0	**149.0**	92.8	**199.0**
-17.8	**0.0**	10.0	**50.0**	37.8	**100.0**	65.6	**150.0**	93.3	**200.0**

TEMPERATURE CONVERSION FORMULAE

$$°C = \frac{5}{9}(°F - 32) \qquad °F = \frac{9}{5}C + 32$$

Conduit Capacity Chart

Conduit Trade Size		1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	3-1/2	4
I.D. Inches		0.622	0.824	1.049	1.380	1.610	2.067	2.731	3.356	3.834	4.334
Internal Area, In2		0.304	0.533	0.864	1.496	2.036	3.356	5.858	8.846	11.545	14.753
1 Conductor (53% fill)		0.161	0.283	0.458	0.793	1.079	1.778	3.105	4.688	6.119	7.819
2 Conductors (31% fill)		0.094	0.165	0.268	0.464	0.631	1.040	1.816	2.742	3.579	4.573
Conductors (40% fill)		0.122	0.213	0.346	0.598	0.814	1.342	2.343	3.538	4.618	5.901
Cable OD Inches	Cable Area In2	Numbers listed below are based off the 1999 NEC (40% fill) for 3 or more non-lead covered cables.									
0.100	0.008	15	26	43	76	104	170	244	375	504	648
0.125	0.012	9	17	27	48	66	109	156	240	322	414
0.150	0.018	6	11	19	33	46	75	108	166	224	288
0.175	0.024	5	8	14	24	34	55	79	122	164	211
0.200	0.031	3	6	10	19	26	42	81	93	126	162
0.225	0.040	3	5	8	15	20	33	48	74	99	128
0.250	0.049	1	4	6	12	16	27	39	60	80	103
0.275	0.059	1	3	5	10	13	22	32	49	66	85
0.300	0.071	1	2	4	8	11	18	27	41	56	72
0.325	0.083	1	1	4	7	9	16	23	35	47	61
0.350	0.096	1	1	3	6	8	13	19	30	41	52
0.375	0.110	1	1	3	5	7	12	17	26	35	46
0.400	0.126	1	1	2	4	6	10	15	23	31	40
0.425	0.142	1	1	1	4	5	9	13	20	27	35
0.450	0.159	1	1	1	3	5	8	12	18	24	32
0.475	0.177	0	1	1	3	4	7	10	17	22	28
0.500	0.196	0	1	1	3	4	6	9	15	20	25
0.525	0.216	0	1	1	2	3	6	8	13	18	23
0.550	0.238	0	1	1	1	3	5	8	12	16	21
0.575	0.260	0	1	1	1	3	5	7	11	15	19
0.600	0.283	0	0	1	1	2	4	6	10	14	18
0.625	0.307	0	0	1	1	2	4	6	9	12	16
0.650	0.332	0	0	1	1	1	4	5	8	11	15
0.675	0.358	0	0	1	1	1	3	5	8	11	14
0.700	0.385	0	0	1	1	1	3	5	7	10	13
0.725	0.413	0	0	1	1	1	3	4	7	9	12
0.750	0.442	0	0	1	1	1	3	4	6	8	11
0.775	0.472	0	0	0	1	1	2	4	6	8	10
0.800	0.503	0	0	0	1	1	2	3	5	7	10
0.825	0.535	0	0	0	1	1	1	3	5	7	9
0.850	0.567	0	0	0	1	1	1	3	5	6	8
0.875	0.601	0	0	0	1	1	1	3	4	6	8
0.900	0.636	0	0	0	1	1	1	3	4	6	8
0.925	0.672	0	0	0	1	1	1	2	4	5	7
0.950	0.709	0	0	0	1	1	1	2	4	5	7
0.975	0.747	0	0	0	1	1	1	1	3	5	6
1.000	0.785	0	0	0	1	1	1	1	3	5	6
1.025	0.825	0	0	0	0	1	1	1	3	4	6
1.050	0.866	0	0	0	0	1	1	1	3	4	5
1.075	0.908	0	0	0	0	1	1	1	3	4	5

Notice:1.The reader is cautioned to consult the 1999 NEC for specific information regarding conduit fill.
2.This Conduit Capacity Chart should only be used as a guide when attempting to estimate conduit fill.
3.For additional information, the reader should refer to the 1999 National Electrical Code, Chapter 9.

Coax Connector Cross Reference

BNC TYPE CONNECTORS

	AMP	IDEAL INDUSTRIES	KINGS ELECTRONICS	RF INDUSTRIES
CATALOG NUMBER	BNC PLUG	BNC PLUG	BNC PLUG	BNC PLUG
RG 8/U				
C1108	--	--	--	RFB-1107-1X
C1154	2-225295-1	--	--	CONTACT RFI
C1180	--	--	KC-59-642 MO6	CONTACT RFI
C1198	--	--	--	CONTACT RFI

	AMP	IDEAL INDUSTRIES	KINGS ELECTRONICS	RF INDUSTRIES
CATALOG NUMBER	BNC PLUG	BNC PLUG	BNC PLUG	BNC PLUG
RG 58/U				
C1117	227079-5	IA-3620	KC-59-347	RFB-1106-2
C1155	227079-5	IA-3620	KC-59-347	RFB-1106-2
C1166	227079-5	IA-3620	KC-59-347	RFB-1106-2
C1178	227079-5	IA-3620	KC-59-347	RFB-1106-2
C1188	227079-5	IA-3620	KC-59-347	RFB-1106-2
C3519	6-227079-8	CONTACT IDEAL	KC-59-347	CONTACT RFI
C3579	6-227079-8	IA-3623	KC-59-347	CONTACT RFI
C5045	227079-5	IA-3620	KC-59-347	RFB-1106-2
C5779	6-227079-7	CONTACT IDEAL	KC-59-347	CONTACT RFI

	AMP	IDEAL INDUSTRIES	KINGS ELECTRONICS	RF INDUSTRIES
CATALOG NUMBER	BNC PLUG	BNC PLUG	BNC PLUG	BNC PLUG
RG 59/U				
C5838	221185-5	CONTACT IDEAL	2065-6-9	RFB-1708

	AMP	IDEAL INDUSTRIES	KINGS ELECTRONICS	RF INDUSTRIES
CATALOG NUMBER	BNC PLUG	BNC PLUG	BNC PLUG	BNC PLUG
RG 62/U				
C1162	227079-7	--	KC-59-348	CONTACT RFI
C1164	227079-7	--	KC-59-348	CONTACT RFI
C3520	4-227079-9	--	KC-59-348	CONTACT RFI

	AMP	IDEAL INDUSTRIES	KINGS ELECTRONICS	RF INDUSTRIES
CATALOG NUMBER	BNC PLUG	BNC PLUG	BNC PLUG	BNC PLUG
RG 174/U				
C1156	1-227079-6	CONTACT IDEAL	KC-59-348	CONTACT RFI

	AMP	IDEAL INDUSTRIES	KINGS ELECTRONICS	RF INDUSTRIES
CATALOG NUMBER	BNC PLUG	BNC PLUG	BNC PLUG	BNC PLUG
RG213/U				
C1176	2-225395-1	--	KC-59-642 MO6	CONTACT RFI

Coax Connector Cross Reference

F TYPE CONNECTORS

	PPC			GILBERT	LRC		IDEAL INDUSTRIES
CATALOG NUMBER	U SERIES U-INDOOR SU-OUTDOOR	UV SERIES UV-INDOOR SUV-INDOOR/ OUTDOOR	EX INDOOR/ OUTDOOR	F-FITTING	F-FITTING	SNAP-N-SEAL	F-TYPE
RG 6/U							
C3521	CFS 6 PL	CONTACT PPC	EX 6 PL	CONTACT GILBERT	PL56CS	--	--
C3523	CFS 6 PL	CONTACT PPC	EX 6 PL	CONTACT GILBERT	PL56CS	--	--
C5760	CFS 6 U (SU)	CFS 6 UV (SUV)	EX 6	GF-6-AHS/USA	AMF6	SNS6	--
C5761	CFS 6 U (SU)	CFS 6 UV (SUV)	EX 6	GF-6-AHS/USA	AMF6	SNS6	85-037
C5774	CFS 6 U (SU)	CFS 6 UV (SUV)	EX 6	GF-6-AHS/USA	AMF6	SNS6	85-037
C5775	CFS 6 U (SU)	CFS 6 UV (SUV)	EX 6	GF-6-AHS/USA	AMF6	SNS6	85-037
C5776	CFS 6 U (SU)	CFS 6 UV (SUV)	EX 6	GF-6-AHS/USA	AMF6	SNS6	85-037
C5777	CFS 6 U (SU)	CFS 6 UV (SUV)	EX 6	GF-6-AHS/USA	AMF6	SNS6	85-037
C5785	CONTACT PPC	CONTACT PPC	CONTACT PPC	CONTACT GILBERT	CONTACT LRC	SNS6QS	85-057
C5802	CFS 6 U (SU)	CFS 6 UV (SUV)	EX 6	GF-6-AHS/USA	AMF6	SNS6	85-037
C5804	CFS 6 U (SU)	CFS 6 UV (SUV)	EX 6	GF-6-AHS/USA	AMF6	SNS6	85-037
C5810	CONTACT PPC	CONTACT PPC	CONTACT PPC	CONTACT GILBERT	CONTACT LRC	CONTACT LRC	--
C5812	CFS 6 U (SU)	CFS 6 UV (SUV)	EX 6	GF-6-AHS/USA	AMF6	SNS6	85-037
C5814	CFS 6 U (SU)	CFS 6 UV (SUV)	EX 6	GF-6-AHS/USA	AMF6	SNS6	85-037
C5820	CFS 6 U (SU)	CFS 6 UV (SUV)	EX 6	GF-6-AHS/USA	AMF6	SNS6	85-037
C5822	CFS 6 U (SU)	CFS 6 UV (SUV)	EX 6	GF-6-AHS/USA	AMF6	SNS6	85-037
C5824	CFS 6 U (SU)	CFS 6 UV (SUV)	EX 6	GF-6-AHS/USA	AMF6	SNS6	85-037
C5826	CFS 6 U (SU)	CFS 6 UV (SUV)	EX 6	GF-6-AHS/USA	AMF6	SNS6	85-037

	PPC			GILBERT	LRC	
CATALOG NUMBER	U SERIES U-INDOOR SU-OUTDOOR	PNU SERIES PNU-INDOOR PNSU-INDOOR/ OUTDOOR	EX INDOOR/ OUTDOOR	F-FITTING	F-FITTING	SNAP-N-SEAL
RG 7/U						
C5851	CFS 7 U (SU)	CFS 7 PNU (PNSU)	EX 7	GAF-236/051-AHS/368	F7CH	SNS7B
C5853	CFS 7 U (SU)	CFS 7 PNU (PNSU)	EX 7	GAF-236/051-AHS/368	F7CH	SNS7B
C5856	CFS 7 U (SU)	CFS 7 PNU (PNSU)	EX 7	GAF-236/051-AHS/368	F7CH	SNS7B
C5857	CFS 7 U (SU)	CFS 7 PNU (PNSU)	EX 7	GAF-236/051-AHS/398	F7QS	SNS7BQ

	PPC			GILBERT	LRC	
CATALOG NUMBER	U SERIES U-INDOOR SU-OUTDOOR	UV SERIES UV-INDOOR SUV-INDOOR/ OUTDOOR	EX INDOOR/ OUTDOOR	F-FITTING	F-FITTING	SNAP-N-SEAL
RG 11/U						
C1160	CONTACT PPC	CONTACT PPC	CONTACT PPC	CONTACT GILBERT	F11QS	SNS11AS
C5011	CFS 11 U (SU)	CFS 11 PNU (PNSU)	EX 11	GF-11-AHS/460	F11QS	SNS11AS
C5025	CFS 11 U (SU)	CFS 11 PNU (PNSU)	EX 11	GF-11-AHS/460	F11QS	SNS11AS
C5027	CONTACT PPC	CONTACT PPC	CONTACT PPC	CONTACT GILBERT	CONTACT LRC	CONTACT LRC
C5029	CFS 11 U (SU)	CFS 11 PNU (PNSU)	EX 11	GF-11-AHS/460	F11QS	SNS11AS
C5034	CFS 11 U (SU)	CFS 11 PNU (PNSU)	EX 11	GF-11-AHS/460	F11QS	SNS11AS
C5039	CFS 11 U (SU)	CFS 11 PNU (PNSU)	EX 11	GF-11-AHS/460	F11QS	SNS11AS
C5041	CFS 11 U (SU)	CFS 11 PNU (PNSU)	EX 11	GF-11-AHS/460	F11QS	SNS11AS
C5043	CFS 11 U (SU)	CFS 11 PNU (PNSU)	EX 11	GF-11-AHS/460	F11QS	SNS11AS
C5044	CFS 11 U (SU)	CFS 11 PNU (PNSU)	EX 11	CONTACT GILBERT	F11QS	SNS11AS

Coax Connector Cross Reference

F TYPE CONNECTORS

	PPC			GILBERT	LRC		IDEAL INDUSTRIES
CATALOG NUMBER	U SERIES U-INDOOR SU-OUTDOOR	UV SERIES UV-INDOOR SUV-INDOOR/ OUTDOOR	EX INDOOR/ OUTDOOR	F-FITTING	F-FITTING	SNAP-N-SEAL	F-TYPE
RG 59/U							
C1102	CONTACT PPC	CONTACT PPC	EX59	GF-59-AHS/322	CONTACT LRC	CONTACT LRC	85-036
C1103	CFS 59 U (SU)	CFS 59 UV (SUV)	EX59	GF-59-AHS/322	AMF59	SNS59	85-036
C1104	CFS 59 U (SU)	CFS 59 UV (SUV)	EX59	GF-59-AHS/322	AMF59	SNS59	85-036
C1106	CFS 59 U (SU)	CFS 59 UV (SUV)	EX59	GF-59-AHS/322	AMF59	SNS59	85-036
C1110	CFS 59 U (SU)	CFS 59 UV (SUV)	EX59	GF-59-AHS/322	AMF59	SNS59	85-036
C1112	CFS 59 U (SU)	CFS 59 UV (SUV)	EX59	GF-59-AHS/322	AMF59	SNS59	85-036
C1135	CFS 59 U (SU)	CFS 59 UV (SUV)	EX59	GF-59-AHS/322	AMF59	SNS59	85-036
C1142	CFS 59 U (SU)	CFS 59 UV (SUV)	EX59	GF-59-AHS/322	AMF59	SNS59	85-036
C3500	CONTACT PPC	CONTACT PPC	CONTACT PPC	GF-59-AHS/312	CONTACT LRC	--	--
C5770	CFS 59 U (SU)	CFS 59 UV (SUV)	EX59	GF-59-AHS/322	AMF59	SNS59	85-036
C5780	CFS 59 U (SU)	CFS 59 UV (SUV)	EX59	GF-59-AHS/322	AMF59	SNS59	85-036
C5782	CFS 59 U (SU)	CFS 59 UV (SUV)	EX59	GF-59-AHS/322	AMF59	SNS59	85-036
C5784	CFS 59 U (SU)	CFS 59 UV (SUV)	--	GF-59-AHS/357	AMF59	SNS59QS	85-059
C5816	CFS 6 JU (SU)	CFS 6 JUV (SUV)	--	--	F304VC	--	--
C5830	CFS 59 U (SU)	CFS 59 UV (SUV)	EX59	GF-59-AHS/322	AMF59	SNS59	85-036
C5832	CFS 59 U (SU)	CFS 59 UV (SUV)	EX59	GF-59-AHS/322	AMF59	SNS59	--
C5834	CFS 59 U (SU)	CFS 59 UV (SUV)	EX59	GF-59-AHS/322	AMF59	SNS59	85-036
C5836	CFS 59 U (SU)	CFS 59 UV (SUV)	EX59	GF-59-AHS/322	AMF59	SNS59	85-036
C5842	CFS 59 U (SU)	CFS 59 UV (SUV)	EX59	GF-59-AHS/322	AMF59	SNS59	85-036
C5844	CFS 59 U (SU)	CFS 59 UV (SUV)	EX59	GF-59-AHS/322	AMF59	SNS59	85-036
C8005	CFS 59 U (SU)	CFS 59 UV (SUV)	EX59	GF-59-AHS/322	AMF59	SNS59	85-036

N TYPE CONNECTORS

	AMP		KINGS ELECTRONICS	RF INDUSTRIES
CATALOG NUMBER	N TYPE PLUG	COMMENTS	N TYPE PLUG	N TYPE PLUG
RG 8/U				
C1108	--	--	KN-59-176	RFN-1007-2SX
C1154	225661-2	Mil Type "O" Crimp Part	KN-59-176	CONTACT RFI
	415232-6	Commercial Type Hex Crimp Part		
C1180	--	--	1205-4-9	CONTACT RFI
C1198	1-225661-6	Mil Type "O" Crimp Part	1205-4-9	CONTACT RFI
	414160-4	Commercial Type Hex Crimp Part		

	AMP		KINGS ELECTRONICS	RF INDUSTRIES
CATALOG NUMBER	N TYPE PLUG	COMMENTS	N TYPE PLUG	N TYPE PLUG
RG 58/U				
C1117	1-225661-2	Mil Type "O" Crimp Part	1205-19-5	RFN-1005-3C
	415232-2	Commercial Type Hex Crimp Part		
C1155	1-225661-2	Mil Type "O" Crimp Part	1205-19-5	RFN-1005-3C
	415232-2	Commercial Type Hex Crimp Part		
C1166	1-225661-2	Mil Type "O" Crimp Part	1205-19-5	RFN-1005-3C
	415232-2	Commercial Type Hex Crimp Part		
C1178	1-225661-2	Mil Type "O" Crimp Part	1205-19-5	RFN-1005-3C
	415232-2	Commercial Type Hex Crimp Part		
C1188	1-225661-2	Mil Type "O" Crimp Part	1205-19-5	RFN-1005-3C
	415232-2	Commercial Type Hex Crimp Part		
C3519	--	--	1205-19-5	CONTACT RFI
C3579	--	--	1205-19-5	CONTACT RFI
C5045	1-225661-2	Mil Type "O" Crimp Part	1205-19-5	RFN-1005-3C
	415232-2	Commercial Type Hex Crimp Part		
C5779	--	--	1205-19-5	CONTACT RFI

Coax Connector Cross Reference

N TYPE CONNECTORS

	AMP		KINGS ELECTRONICS	RF INDUSTRIES
CATALOG NUMBER	N TYPE PLUG	COMMENTS	N TYPE PLUG	N TYPE PLUG
RG 59/U				
C5838	--	--	--	CONTACT RFI

	AMP		KINGS ELECTRONICS	RF INDUSTRIES
CATALOG NUMBER	N TYPE PLUG	COMMENTS	N TYPE PLUG	N TYPE PLUG
RG 62/U				
C1162	--	--	--	CONTACT RFI
C1164	--	--	--	CONTACT RFI
C3520	--	--	--	CONTACT RFI

	AMP		KINGS ELECTRONICS	RF INDUSTRIES
CATALOG NUMBER	N TYPE PLUG	COMMENTS	N TYPE PLUG	N TYPE PLUG
RG 174/U				
C1156	--	--	--	CONTACT RFI

	AMP		KINGS ELECTRONICS	RF INDUSTRIES
CATALOG NUMBER	N TYPE PLUG	COMMENTS	N TYPE PLUG	N TYPE PLUG
RG213/U				
C1176	1-227086-0	Mil Type "O" Crimp Part	KN-59-202	CONTACT RFI
	415232-6	Commercial Type Hex Crimp Part		

AWG Conductor Chart

COPPER CONDUCTOR DATA

The conductors used by BICCGeneral meet the applicable requirements of ASTM specifications B-3, B-33, B-172, B-173, B-174 and B-286 and Federal Specification QQ-W-343.

The following data covers the more commonly used conductor constructions in the electrical and electronics industry. Special constructions, not shown, are available or can be designed to meet specific requirements. It is suggested that the BICCGeneral Product Engineering Department be contacted before a specification is finalized.

AWG	STRANDING	TYPE STRANDING[1]	DIAMETER[4]		AREA		WEIGHT		D.C. RESISTANCE 20°C[2]				BREAK STR. LBS.
									TIN COATING[3]		BARE OF SILVER COATING		
			in.	mm	circ. mils	sq. mm.	lbs/M'	kg/km.	Ω/M'	Ω/km.	Ω/M'	Ω/km.	
32	7/40	Co or Bu	.0096	.254	100	.051	.21	.31	176.00	577.00	164.00	538.00	1.986
30	Solid	–	.010	.254	100	.051	.30	.45	113.00	371.00	104.00	340.00	3.157
	7/38	Bu	.012	.305	112	.057	.35	.52	106.00	348.00	92.60	303.00	
28	Solid	–	.01264	.321	159	.081	.48	.72	70.80	232.00	65.30	214.00	5.020
	7/36	Co	.015	.381	175	.089	.55	.82	67.50	221.00	59.30	194.00	
27	Solid	–	.0142	.361	202	.102	.61	.91	55.60	182.00	51.40	169.00	6.331
	7/35	Co or Bu	.017	.432	220	.111	.69	1.04	53.80	176.00	–	–	
26	Solid	–	.016	.404	253	.128	.77	1.14	44.50	146.00	41.00	135.00	7.983
	7/34	Co or Bu	.019	.483	278	.141	.87	1.29	42.50	139.00	37.30	122.00	
	10/36	Bu	.0193	.490	250	.127	.78	1.15	47.30	155.00	40.40	133.00	
	19/38	Bu or Co	.021	.533	304	.154	.97	1.44	38.90	128.00	34.10	112.00	
24	Solid	–	.0201	.511	404	.205	1.22	1.82	27.20	89.20	25.70	84.20	12.690
	7/32	Co or Bu	.024	.610	448	.227	1.38	2.05	25.70	84.20	23.10	75.90	
	16/36	Bu	.024	.610	400	.201	1.25	1.64	29.50	96.80	27.50	90.20	
	19/36	Co or Bu	.025	.635	475	.241	1.48	2.20	24.90	81.70	21.80	71.60	
22	Solid	–	.025	.643	643	.324	1.94	2.89	16.70	54.80	16.20	53.20	19.430
	7/30	Co or Bu	.030	.762	700	.355	2.19	3.26	16.60	54.40	14.80	48.60	
	19/34	Bu or Eq	.0315	.800	754	.382	2.35	3.50	15.50	50.80	13.80	45.10	
20	Solid	–	.032	.813	1,020	.519	3.10	4.61	10.50	34.40	10.10	33.20	30.890
	7/28	Co or Bu	.038	.965		.562	3.49	5.19	10.30	33.80	9.33	30.60	
	10/30	Bu	.037	.940	1,111	.507	3.14	4.67	11.40	37.40	10.40	34.00	
	19/32	Co, Bu or Eq	.040	1.02	1,000	.616	3.84	5.71	9.48	31.10	8.53	28.00	
	26/34	Bu	.039	.940	1,216	.523	3.28	4.88	11.30	37.10	–	–	
19	Solid	–	.0359	.912	1,032	.653	3.90	5.80	–	–	8.05	26.40	38.950
18	Solid	–	.0403	1.024	1,290	.823	4.92	7.32	6.77	22.20	6.39	21.00	49.120
	7/26	Co or Bu	.048	1.22	1,620	.897	5.55	8.26	6.45	21.20	5.55	19.20	
	16/30	Bu	.0475	1.207	1,770	.810	5.01	7.45	7.15	23.40	6.48	21.30	
	19/30	Co, Bu or Eq	.050	1.27	1,600	.963	5.95	8.85	6.10	20.00	5.46	17.90	
	41/34	Bu	.049	1.244	1,900	.824	5.09	7.08	7.08	23.20	6.60	21.60	
16	Solid	–	.0508	1.29	1,627	1.31	7.81	11.60	4.47	14.70	4.16	13.60	78.100
	19/294	Bu or Eq	.057	1.45	2,580	1.23	7.52	11.20	4.82	15.80	4.27	14.00	
	19/.0117	Bu	.0585	1.50	2,426	1.32	8.02	11.90	4.39	14.40	4.13	13.50	
	26/30	Bu	.0606	1.54	2,601	1.32	8.15	12.10	4.39	14.40	3.99	13.10	
	65/34	Bu	.060	1.52	2,600	1.31	8.20	11.90	4.47	14.70	4.16	13.60	
14	Solid	–	.0641	1.63	2,581	2.08	12.4	18.50	2.68	8.79	2.52	8.28	124.200
	7/.0242	Bu	.073	1.85	4,110	2.08	12.7	18.90	–	–	2.61	8.56	
	19/274	Co, Eq or Un	.071	1.80	4,100	1.94	12.1	18.00	3.05	10.00	2.71	8.88	
	19/.0147	Cu	.074	1.88	3,831	2.08	12.7	18.90	2.73	–	2.61	8.56	
	41/30	Bu	.077	1.96	4,106	2.08	12.9	19.20	2.81	9.22	2.53	8.30	
12	Solid	–	.0808	2.05	4,100	3.31	19.8	29.50	1.69	5.54	1.59	5.21	197.500
	7/.0305	Co	.092	2.34	6,530	3.30	20.2	30.10	–	–	1.64	5.38	
	19/254	Co, Eq or Un	.0905	2.299	6,512	3.08	19.4	28.90	1.87	6.13	1.70	5.59	
	19/.0185	Bu	.0925	2.35	6,088	3.30	20.2	30.10	–	–	1.64	5.25	
	65/30	Bu	.094	2.388	6,503	3.29	20.8	31.10	1.82	5.97	1.64	5.25	
10	Solid	–	.1019	2.588	6,500	5.26	31.4	46.80	–	–	1.00	3.28	314.500
	7/.0385	Co	.116	2.95	10,380	5.25	32.0	47.60	–	–	1.00	3.28	
	19/.0234	Bu	.117	2.97	10,376	5.27	32.0	47.60	–	–	.98	3.21	
	37/.0169	Co	.112	2.84	10,404	4.74	29.2	43.40	–	–	1.25	4.10	
	105/30	Bu	.126	3.20	9,361	5.32	33.8	49.20	1.10	3.61	.99	3.24	
8	7/.0486	Co	.146	3.71	10,500	8.38	50.1	74.50	–	–	.65	2.13	
	19/.0295	Bu or Eq	.144	3.66	16,534	8.38	50.0	74.40	–	–	.65	2.13	
	133/29	Ro 19■7/29	.169	4.293	16,535	8.61	54.0	80.40	.71	2.33	–	–	
	168/30	Ro 7■24/30	.174	4.42	16,983	8.51	53.4	79.00	.70	2.30	–	–	
6	19/.0374	Bu	.188	4.775	16,800	13.33	81.1	121.00	–	–	.40	1.30	
	133/27	Ro 19■7/27	.213	5.41	26,576	13.60	84.1	125.00	.43	1.41	–	–	
	266/30	Ro 7■38/30	.222	5.64	26,818	13.49	83.2	124.00	.44	1.44	–	–	
4	133/25	Ro 19■7/25	.257	6.53	26,600	21.61	135	201.00	.29	.95	–	–	
	420/30	Ro 7■60/30	.270	6.850	42,615	21.29	140	208.00	.28	.92	–	–	
2	665/30	Ro 19■35/30	.338	8.59	42,000	33.72	213	317.00	.18	.59	–	–	

[1]Bu-Bunched; Co - Concentric; Eq - Equilay; Ro - Rope; Un - Unilay

[2]Typical D.C. Resistance values for uninsulated wires. Multiply by 1.04 for typical values after insulation

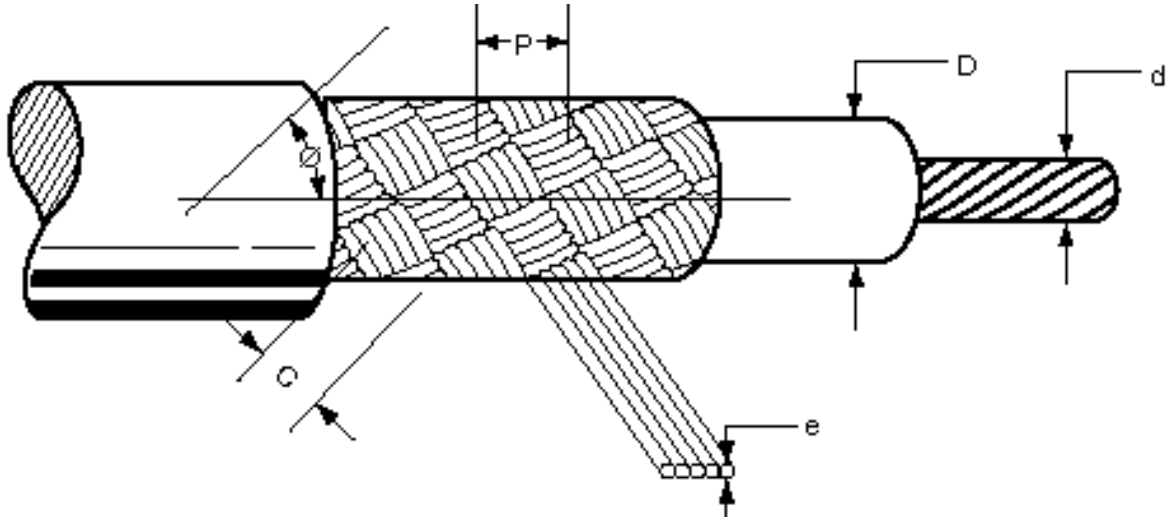
[3]Values are for tinned, heavy tinned, prefused, overcoated or topcoated conductors

[4]Does not meet UL conductor stranding requirements

CAROL BRAND

BICCGeneral

Cable Design Equations - Braid Shield



BRAID PICKS PER INCH:

$$Ø = \tan^{-1}\left[\frac{2p\,(D+2e)\,P}{C}\right] \text{ DEGREES}$$

BRAID PICKS PER INCH:

$$P = \frac{(C)\,(\tan Ø)}{2p\,(M)}, \text{ PICKS/INCH}$$

BRAID SHIELD DC RESISTANCE:

$$W = \frac{(n)\,(C)\,(l)}{\cos Ø}, \text{ LBS/M FT}$$

BRAID SHIELD DC RESISTANCE:

$$R_{dc} = \cos\frac{r_{dc}}{(n)\,(C)\,(\cos Ø)}, \Omega/\text{kft}$$

% Coverage: $\%C = (2F - F^2)\ x100$

% Coverage Factor for Common Coverage:	
F	% Coverage
0.368	60
0.409	65
0.453	70
0.500	75
0.553	80
0.617	85

where:

D	= diameter under shield, inches
d	= diameter of center conductor, inches
C	= number of carriers
e	= diameter of end
P	= pick (measured in picks per linear inch)
Ø	= braid angle, degrees
W	= weight of shield, lbs/M ft
n	= number of ends in one carrier
l	= weight of one end in lbs/M ft
M	= D + build-up of braid on one shield wall, inches
R_{dc}	= dc resistance of the braid shield, Ω/M ft
^{r}dc	= dc resistance of one strand (end) of shield, Ω/M ft
% C	= percent braid coverage
F	= % coverage factor

Cable Design Equations - Coaxial Cable

COAXIAL CABLE CAPACITANCE:

$$C = \frac{7.36e}{LOG\left(\frac{D}{fd}\right)}, \text{ pF/ft}$$

COAXIAL CABLE VELOCITY OF PROPAGATION:

$$V_p = \frac{100}{e^{1/2}}, \%$$

COAXIAL CABLE INDUCTANCE:

$$L = 0.140 \text{ LOG } \left(\frac{D}{fd}\right), \mu H/ft$$

COAXIAL CABLE TIME DELAY:

$$t_d = 1.016\, e^{1/2}, \text{ nsec/ft}$$

COAXIAL CABLE IMPEDANCE:

$$Z_o = \frac{138}{e^{1/2}} \text{ LOG } \left(\frac{D}{fd}\right), \Omega$$

COAXIAL CABLE CUTOFF FREQUENCY:

$$f_{co} = \frac{7.50}{e^{1/2}(D + fd)}, \text{ GHz}$$

where:

- C = capacitance, pF/ft
- e = insulation dielectric constant (see table below)
- D = diameter under the shield, inches
- d = diameter of the center conductor, inches
- L = inductance, μH/ft
- f = strand factor (see Table II page 138)
- Z_o = characteristic impedance, Ω
- V_p = velocity of propagation, %
- t_d = time delay, nsec/ft
- f_{co} = cutoff frequency, GHz

MATERIAL	e	POWER FACTOR, PF
FEP Teflon (Cellular)	1.40	0.0002
FEP Teflon (Solid)	2.10	0.0003
PE (Cellular)	1.56	0.0003
PE (Solid)	2.26	0.0003
PE (Semi-Solid)	1.29	0.0003

Cable Design Equations - Balanced Pair

CAPACITANCE (UNSHIELDED TWISTED PAIR):

$$C = \frac{2.2\,e}{\text{LOG}\left[\frac{1.3\,(D)}{(f)\,(d)}\right]}, \text{ pF/ft}$$

IMPEDANCE (UNSHIELDED TWISTED PAIR):

$$Z_o = \frac{1016\,e^{1/2}}{C}, \Omega$$

CAPACITANCE (SHIELDED TWISTED PAIR):

$$C = \frac{3.7\,e}{\text{LOG}\left[\frac{1.2\,(D)}{(f)\,(d)}\right]}, \text{ pF/ft}$$

IMPEDANCE (SHIELDED TWISTED PAIR):

$$Z_o = \frac{276}{e^{1/2}}\,\text{LOG}\left[\frac{1.2\,(D)}{(f)\,(d)}\right], \Omega$$

CAPACITANCE (OVERALL SHIELDED & CABLED):

$$C = \frac{2.9\,e}{\text{LOG}\left[\frac{1.5\,(D)}{(f)\,(d)}\right]}, \text{ pF/ft}$$

IMPEDANCE (OVERALL SHIELDED & CABLED):

$$Z_o = \frac{347}{e^{1/2}}\,\text{LOG}\left[\frac{1.5\,(D)}{(f)\,(d)}\right], \Omega$$

where:

- C = mutual capacitance, pF/ft
- e = insulation dielectric constant (see Table I)
- f = stranding factor (see Table II)
- d = diameter of the conductor, inches
- D = diameter over the insulation, inches
- Z_o = characteristic impedance Ω

TABLE I

DIELECTRIC CONSTANTS & V_p OF INSULATIONS

MATERIAL	e	V_p, %
ECTFE (Halar™)	2.6	63
PFA Teflon	2.15	68
PVC	5.0	45
PVC (Semi-rigid)	3.6	53
PVDF (Kynar™, SOLEF™)	7.7	36
Polyethylene	2.29	66
Polypropylene	2.25	67
Polyurethane	6.5	39
Rubber, butyl	4.0	50
Rubber, natural	5.0	45
Rubber, SBR	4.0	50
Rubber, silicone	3.1	57
TFE Teflon™	2.1	69
TPE	5.0	45
Teflon™	2.1	69
Tefzel™	2.6	62

TABLE II

NO. OF STRANDS	*f*
1	1.000
7	0.939
19	0.970
37	0.980
61	0.985
91	0.988

Engineering Prefixes

PREFIX	SYMBOL	MULTIPLYING FACTOR	
		SCIENTIFIC	CONVENTIONAL
tera	T	10^{12}	1,000,000,000,000
giga	G	10^{9}	1,000,000,000
mega	M	10^{6}	1,000,000
kilo	k	10^{3}	1,000
hecto	h	10^{2}	100
deca	da	10^{1}	10
deci	d	10^{-1}	0.1
centi	c	10^{-2}	0.01
milli	m	10^{-3}	0.001
micro	µ	10^{-6}	0.000001
nano	*n*	10^{-9}	0.000000001
pico	*p*	10^{-12}	0.000000000001
femto	*f*	10^{-15}	0.000000000000001
atto	*a*	10^{-18}	0.000000000000000001

Glossary

Abrasion Resistance: Resistance to surface wear.
AC Alternating Current (a.c.): Current in which the charge-flow periodically reverses and is represented by: $I = I_o \cos(2f + \phi)$ where, I is the current, I_o is the amplitude, f the frequency, ϕ the phase angle.
Accelerated Aging: A test that attempts to duplicate long time environmental aging in comparatively short time spans.
Accelerator: A chemical additive which hastens a chemical reaction under specific conditions.
Accordion: (1) A retractile cable with a series of equally-spaced transverse folds. (2) A connector contact with a "Z" shaped flat spring to permit high deflection without overstress.
Adapter: A device that enables any or all of the following a) different sizes or types of plugs to mate with one another or to fit into a telecommunications outlet/connector; b) the rearrangement of leads; c) large cables with numerous wires to fan out into smaller groups of wires, d) interconnection between cables.
Adhesive Bonded: Cables bonded by adding an adhesive coating to the surface of the cable components, then joining and curing the adhesive to form a cable. See Bonded Cables.
Administration: The method for labeling, identification, documentation and usage needed to implement moves, additions and changes of the telecommunications infrastructure.
Admittance: The measure of the ease with which an alternating current flows in a circuit. The reciprocal of impedance.
Aerial Cable: A cable suspended in the air on poles or other overhead structure.
Aging: The change in properties of a material with time under specific conditions.
Air Core Cable: A cable in which the interstices in the cable core are not filled with a moisture barrier.
Air-Handling Plenum: A designated area, closed or open, used for environmental air.
Air Spaced Coaxial Cable: One in which air is essentially the dielectric material. A spirally wound synthetic filament, beads, or braided filaments may be used to center the conductor.
All-Rubber Cable: A cable in which all interstices between conductors are filled with rubber compound.
Alligator Clip: A mechanical device shaped like alligator jaws used as a temporary connection on the end of interconnections wire.
Alloy: A metal formed by combining two or more different metals to obtain desirable properties.
Aluminum Conductor: An aluminum wire or group of wires not suitably insulated to carry electrical current.
Aluminum-Steel Conductor: A composite conductor made up of a combination of aluminum and steel wires.
Ambient Temperature: The temperature of a medium (gas or liquid) surrounding an object.
American Wire Gauge (AWG): The standard system used for designating wire diameter. The lower the AWG number, the larger the diameter. Also called the Brown and Sharpe (B&S) wire gauges.
Ampacity: See Current Carrying Capacity.
Ampere: The unit of current. One ampere is the current flowing through one ohm of resistance at one volt potential.
Analog: A signaling format that uses continuous physical variables such as voltage amplitude or frequency variations to transmit information.
Anneal: Relief of mechanical stress through heat and gradual cooling. Annealing copper renders it less brittle.
Annular Conductor: A number of wires stranded in three reversed concentric layers around a core.
Annunciator: A signaling device, usually electrically operated, that gives an audible or visual signal (or both) when energized.
Anti-Oxidant: A substance which prevents or slows down oxidation of material exposed to air.
Appliance Wire and Cable: A classification covering insulated wire and cable for internal wiring of appliances and equipment.
Arc Resistance: The time required for an arc to establish a conductive path in a material.
Armored Cable: A cable provided with a wrapping of metal for mechanical protection.
Attenuation: The decrease in magnitude of the power of a signal in transmission between points. Attenuation is usually measured in decibels per unit length at a specific frequency.
Attenuation to Crosstalk Ratio (ACR): The difference between attenuation and crosstalk, measured in dB, at a given frequency. Important characteristic in networking transmission to assure that signal sent down a twisted pair is stronger at the receiving end, after being attenuated, than are any interference signals imposed on that same pair by crosstalk from other pairs, represented by NEXT.
Audio Frequency: The range of frequencies audible to the human ear. Usually 20-20,000 Hz.
Backbone: A facility (e.g. pathway, cable or conductors) between telecommunications closets, or floor distribution terminals, the entrance facilities, and the equipment rooms within or between buildings.
Backbone Cable or Wire: Cable or wire found in the backbone, see Backbone.
Balanced Line: A cable having two identical conductors which carry voltages opposite in polarity and equal in magnitude with respect to ground.
Balun: A device for matching an unbalanced coaxial transmission line to a balanced two-wire system.
Band Marking: A continuous circumferential band applied to a conductor at regular intervals for identification.
Banded Cable: Two or more cables banded together by stainless steel strapping.
Bandwidth: A continuous range of frequencies extending between two limiting frequencies. Also referred to as a frequency band.
Barrel-Packed: Method of coiling into a fiber drum for shipment.
Baseband: In data transmission, the use of a dedicated end-to-end connection to carry a single channel only.
Beaded Coax: Coaxial cable with a dielectric consisting of beads made of various materials.
Belt: Number of layers of insulation on a conductor, or number of layers of jacket on a cable.
Belted-Type Cable: Multiple conductor cable having a layer of insulation over the assembled insulated conductors.
Bend Loss: A form of increased attenuation caused by (a) having an optical fiber curved around a restrictive radius of curvature or (b) microbends caused by minute distortions in the fiber imposed by externally induced forces.
Bend Radius: Radius of curvature that a fiber optic or metallic cable can bend without any adverse effects.
Bifilar: A winding made non-inductive by winding together (as one wire) two wires carrying current in opposite directions.
Billion Conductor Feet (BCF): A quantity derived by multiplying the number of conductors in a cable by the amount of cable. Usually used to indicate plant capacity or an annual requirement.
Bimetallic Wire: A wire formed of two different metals joined together (not alloyed). It can include wire with a steel core clad wire, or plated or coated wire.
Binder: A spirally served tape or thread used for holding assembled cable components in place awaiting subsequent manufacturing operations.
Binding Post: A device for clamping or holding electrical conductors in a rigid position.
Bit: One binary (0 or 1) digit.
Blown Jacket: Outer cable covering applied by controlled inflation of the cured jacket tube then pulling the cable through it.
Bond Strength: Amount of adhesion between bonded surfaces, e.g. in cemented ribbon cable.
Bondable Wire: An insulated wire treated to facilitate adherence to materials such as potting compounds. Also, magnet wires used in making coils when bonding the turns together is desired.
Bonded Cable: Cable consisting of pre-insulated conductors or multiconductor components laid-in parallel and bonded into a flat cable. See Solvent-Bonded; Adhesive-Bonded; Film-Bonded.
Bonded Construction: An insulation construction in which the glass braid and nylon jacket are bonded together.
Bonding: The permanent joining of metallic parts to form an electrically conductive path that will assure electrical continuity and the capacity to conduct safely any current likely to be imposed on it.
Booster: A device inserted into a line (or cable) to increase the voltage.
Boot: (1) Protective covering over a cable, wire, or connector in addition to the normal jacketing or insulation. (2) A form placed around wire termination of a multiple-contact connector to contain the liquid potting compound before it hardens.
Braid: A fibrous or metallic group of filaments interwoven in cylindrical form to form a covering over one or more wires.
Braid Angle: The smaller of the two angles formed by the shielding strand and in the axis of the cable being shielded.
Braid Carrier: A spool or bobbin on a braid which holds one group of strands or filaments consisting of a specific number of ends. The carrier revolves during braiding operations.

Glossary

Braid Ends: The number of strands used to make up one carrier. The strands are wound side by side on the carrier bobbin and lie parallel in the finished braid.
Braiding Machine: Machine used to apply braids to wire and cable and to produce braided sleeving and braids for tying or lacing purposes. Braiding machines are identified by the number of carriers.
Breakdown (Puncture): A disruptive discharge through the insulation.
Breakdown Voltage: The voltage at which the insulation between two conductors breaks down.
Breakout: The point at which a conductor or group of conductors breaks out from a multiconductor cable to complete circuits at various points along the main cable.
Bridge: A device used to expand a local area network by forwarding frames between data link layers.
Bridged Tap: The multiple appearances of the same cable pair at several distribution points.
British Standard Wire Gauge: A modification of the Birmingham Wire Gauge and the legal standard of Great Britain for all wires. Also known as Standard Wire Gauge (SWG), New British Standard (NBS), English Legal Standard and Imperial Wire Guide.
Broadband: In data transmission, the use of a carrier signal, rather than direct modulation, to carry several simultaneous channels.
Buffer: (fiber optic) A soft material which mechanically isolates individual fibers in a fiber optic cable or bundle from small geometrical irregularities, distortions, or roughness of adjacent surfaces.
Buffing Stripper: A motorized device for removing flat cable insulation by means of buffing wheels that melt the insulation and brush it away from the conductors. Also called Abrasion Stripper.
Building Entrance Area: See Entrance Room or Space, Telecommunications.
Building Wire: Wire used for light and power, 600 volts or less, usually not exposed to outdoor environment.
Bunched Stranding: A group of strands twisted together in a random manner and the same direction without regard to geometric arrangement of specific strands.
Buncher: A machine that twists wires together in random arrangement.
Bundle: (fiber optic) A number of fibers grouped together, usually carrying a common signal.
Buried Cable: A cable installed directly in the earth without use of underground conduit. Also called “direct burial cable.”
Bus: Wire used to connect two terminals inside of an electrical unit.
Bushing: A mechanical device used as a lining for an opening to prevent abrasion to wire and cable.
Butt: Joining of two conductors end-to-end, with no overlap and with the axes in line.
Butt Splice: A splice wherein two wires from opposite ends butt against each other, or against a stop, in the center of a splice.
Butt Wrap: Tape wrapped around an object or conductor in an edge-to-edge condition.
Byte: Typically a group of eight binary digits.
Cable: A stranded conductor with or without insulation and other coverings (single-conductor cable), or a combination of conductors (multiple-conductor cable). In fiber optics, a jacketed fiber or jacketed bundle in a form which can be terminated.
Cable Assembly: Typically, the cable and associated connectors; ready to install.
Cable Clamp: A device used to give mechanical support to the wire bundle or cable at the rear of a plug or receptacle.
Cable Clamp Adapter: A mechanical adapter that attaches to the rear of a plug or receptacle to allow the attachment of a cable clamp.
Cable Core: The portion of an insulated cable lying under a protective covering.
Cable Core Binder: A wrapping of tapes or cords around the conductors of a multiple-conductor cable used to hold them together.
Cable Filler: The material used in multiple-conductor cables to occupy the interslices formed by the assembly of the insulated conductors, thus forming a cable core.
Cable Rack: The vertical or horizontal open support (usually made of aluminum or steel) that is attached to a ceiling or wall.
Cable Sheath: The overall protective covering applied to cables.
Cable Tray: A ladder, trough, solid-bottom or channel raceway system intended for, but not limited to, the support of telecommunications media (e.g., cable).
Cable Vulcanizer: Compression molding machine used to repair cable jacketing that has had a part removed for splicing, for adding connectors or other devices, or for replacing damaged sections.
Cabling: (1) A combination of all cables, wire, cords and connecting hardware. (2) Twisting together two or more insulated conductors by machine to form a cable. In fiber optics, a method by which a group or bundle of fibers is mechanically assembled.
Cabling Factor: Used in the formula for calculating the diameter of an unshielded, unjacketed cable. D = Kd, where D is the cable diameter, K is the factor and d is the diameter of one insulated conductor.
Campus: The building and grounds of a complex (e.g. a university, college, industrial park or military establishment).
Canadian Standards Association (CSA): A non-profit independent organization which operates a listing service for electrical and electronic materials and equipment. The Canadian counterpart of the Underwriter’s Laboratories.
Capacitance: The ratio of the electrostatic charge on a conductor to the potential difference between the conductors required to maintain that charge.
Capacitance, Direct: The capacitance measured from one conductor to another conductor through a single insulating layer.
Capacitance, Mutual: The capacitance between two conductors (typically of a pair) with all other conductors, including shield, short circuited to ground.
Carrier: The woven element of a braid consisting of one or more ends (strands) which creates the interlaced effect. Also, a spindle, spool, tube, or bobbin (on a braiding machine) containing yarn or wire, employed as a braid.
Cellular Plastics: Expanded or “foam,” consists of individual closed cells of inert gas suspended in a plastic medium, resulting in a desirable reduction of the dielectric constant.
Central Office: The place where communications common carriers terminate customer lines and locate switching equipment that interconnects those lines.
Certificate of Compliance (C of C): A written statement; normally generated by a Quality Control Department, which states that the product being shipped meets customer’s specifications.
Certified Test Report (CTR): A report reflecting actual test data on the cable shipped. Tests are normally conducted by the Quality Control Department, and show that the product being shipped meets the required test specifications.
Characteristic Impedance: The impedance that, when connected to the output terminals of a transmission line, of any length, makes the line appear indefinitely long.
Chlorosulfonated Polyethylene (CSPE): A rubbery polymer used for insulations and jackets. Manufactured by E.I. DuPont under the trade name of Hypalon.
Cigarette Wrap: Tape insulation wrapped longitudinally instead of spirally over a conductor.
Circuit: A complete path over which electrons can flow from the negative terminals of a voltage source through parts and wires to the positive terminals of the same voltage source.
Circuit Sizes: A popular term for building wire sizes 14 through 10 AWG.
Circular Mil: The area of a circle one mil (.001") in diameter; 7.854×10^{-7} sq. in. Used in expressing wire cross sectional area.
Cladding: Method of applying a layer of metal over another metal whereby the junction of the two metals is continuously welded. In fiber optics, a sheathing intimately in contact with the core of a higher refractive index material which serves to provide optical insulation and protection to the reflection interface.
Closed End Splice: An insulated splice in which two or more wires overlap and enter the splice from the same end of the barrel.
Closet, Telecommunications: An enclosed space for housing telecommunications equipment, cable terminations, and cross-connect cabling. The closet is the recognized location of the cross-connect between the backbone and horizontal facilities.
Coaxial Cable: A cable consisting of two cylindrical conductors with a common axis, separated by a dielectric.
Coaxial Connector: A connector that has a coaxial construction and is used with coaxial cable.
Coherent Source: (fiber optic) A light source which emits a very narrow, unidirectional beam of light of one wavelength (monochromatic).
Coil Effect: The inductive effect exhibited by a spiral-wrapped shield, especially above audio frequencies.

Glossary

Cold Flow: Permanent deformation of the insulation due to mechanical force of pressure (not due to heat softening).
Color Code: A color system for wire or circuit identification by use of solid colors, tracers, braids, surface printing, etc.
Commercial Building: A building or portion thereof, that is intended for office use.
Common Axis Cabling: In multiple cable constructions, a twisting of all conductors about a "common axis" to result in smaller diameter constructions. Tends to result in greater susceptance to electromagnetic and electrostatic interference.
Compact Conductor: Stranded conductor rolled to deform the round wires to fill the normal interstices between the wires in a strand.
Composite (Clad) Wire: A wire having a core of one metal with a fused outer shell of different metals.
Composite Conductor: Two or more strands of different metals assembled and operated in parallel.
Compound: An insulating or jacketing material made by mixing two or more ingredients.
Compression Cable: A pipe type cable in which the pressure medium is separated from the insulation by a membrane or sheath.
Concentric: A central core surrounded by one or more layers of helically wound strands in a fixed round geometric arrangement.
Concentric-Lay Cable: A concentric-lay conductor, or a multiple-conductor cable composed of a central core surrounded by one or more layers of helically laid insulated conductors.
Concentric Strand: A strand that consists of a central wire or core surrounded by one or more layers of spirally laid wires.
Concentricity: The measurement of the location of the center of the conductor with respect to the geometric center of the circular insulation.
Conductance: The ability of a conductor to carry an electric charge. The ratio of the current flow to the potential difference causing the flow. The reciprocal of resistance.
Conductivity: The capacity of a material to carry electrical current—usually expressed as a percentage of copper conductivity (copper being 100%).
Conductor: A wire (or combination of wires not insulated from one another) suitable for carrying electric current.
Conduit: A rigid or flexible metallic or nonmetallic raceway of circular cross section through which cables can be pulled or housed.
Connecting Hardware: A device providing mechanical cable terminations.
Connector: A device used to provide rapid connect/disconnect service for electrical cable and wire terminations.
Contact: The part of a connector which actually carries the electrical current, and are touched together or separated to control the flow.
Contact Inspection Hole: A hole in the cylindrical rear portion of contact used to check the depth to which a wire has been inserted.
Contact Size: The largest size wire which can be used with the specific contact. Also, the diameter of the engagement end of the pin.
Continuity Check: A test to determine whether electrical current flows continuously throughout the length of a single wire or individual wires in a cable.
Continuous Vulcanization: Simultaneous extrusion and vulcanization of rubber-like wire coating materials.
Contrahelical: Cable spiralling in an opposite direction than the preceding layer within a wire or cable.
Control Cable: A multi-conductor cable made for operation in control of signal circuits.
Controlled Impedance Cable: Package of two or more insulated conductors where impedance measurements between respective conductors are kept essentially constant throughout the entire length.
Copolymer: A compound resulting from the polymerization of two different monomers.
Copper-Clad: Steel with a coating of copper welded to it before drawing as opposed to copper-plated. Synonymous with Copperweld.
Copperweld: The trade name of Flexo Wire Division (Copperweld Steel Corp.) for their copper-clad steel conductors.
Cord: A small, flexible insulated cable.
Cord Set: Portable cords fitted with a wiring device at one or both ends.
Cord, Telecommunications: A cable using stranded conductors for flexibility, as in distribution cords or line cords. Line cords can also use tinsel conductors.
Core: In cables, a component or assembly of components over which other materials are applied, such as additional components, shield, sheath, or armor. In fiber optics, the transparent glass or plastic section with a high refractive index through which the light travels by internal reflections.
Corona: A discharge due to ionization of air around a conductor due to a potential gradient exceeding a certain critical value.
Corona Resistance: The time that the insulation will withstand a specified level of field-intensified ionization that does not result in the immediate complete breakdown of the insulation.
Corrosion: The destruction of the surface of a metal by chemical reaction.
Coupling Loss: (fiber optic) Signal losses due to small differences in numerical aperture, core diameter, core concentricity, and tolerances in splicing connectors when two fibers are aligned. Also known as Splicing Loss and Transfer Loss.
Coupling Ring: A device used on cylindrical connectors to lock plug and receptacle together.
Coverage: The calculated percentage which defines the completeness with which a metal braid covers the underlying surface. The higher percentage of coverage, the greater the protection against external interference.
Covering: Textile braid or jacket of rubber, plastics, or other materials applied over wire and cables to provide mechanical protection and identification.
Crazing: The minute cracks on the surface of plastic materials.
Creep: The dimensional change with time of a material under load.
Creepage: The conduction of electricity across the surface of a dielectric.
Creepage Path: The path across the surface of a dielectric between two conductors.
Creepage Surface: An insulating surface which provides physical separation as a form of insulation between two electrical conductors of different potential.
Crimp: Act of compressing a connector barrel around a cable in order to make an electrical connection.
Crimp Termination: Connection in which a metal sleeve is secured to a conductor by mechanically crimping the sleeve with pliers, presses, or automated crimping machines.
Cross-Connect: A facility enabling the termination of cable elements and their interconnection, and/or cross-connection, primarily by means of a patch cord or jumper.
Cross-Linked: Inter-molecular bonds between long chain thermoplastic polymers by chemical or electron bombardment means. The properties of the resulting thermosetting material are usually improved.
Crosstalk: Undesired electrical currents in conductors caused by electromagnetic or electrostatic coupling from other conductors or from external sources. Also, leakage of optical power from one optical conductor to another.
CSA: Canadian Standards Association.
C-SJ: Same as SJ except extra-flexible conductor.
C-SJO: Same as SJO except extra-flexible conductor.
Cure: To change the physical properties of a material by chemical reaction.
Curing Cycle: The time, temperature, and pressure required for curing.
Curl: The degree to which a wire tends to form a circle after removal from a spool. An indication of the ability of the wire to be wrapped around posts in long runs.
Current: The rate of transfer of electricity. Practical unit is the ampere which represents the transfer of one coulomb per second. In a simple circuit, current (I) produced by a cell or electromotive force (E) when there is an external resistance (R) and internal resistance (r) is: $I = \frac{E}{R + r}$
Current Carrying Capacity: The maximum current an insulated conductor can safely carry without exceeding its insulation and jacket temperature limitations.
Customer Premises: Building(s) with grounds and appurtenances (belongings) under the control of the customer.
Cut-Through Resistance: The ability of a material to withstand mechanical pressure, usually a sharp edge or small radius, without separation.
Cycle: The complete sequence including reversal of the flow of an alternating electric current.
Decibel (dB): A unit to express differences of power level. Used to express power gain in amplifiers or power loss in passive circuits or cables.
Delay Line: A cable made to provide very low velocity of propagation with long electrical delay for transmitted signals.
Demarcation Point: A point where the operational control or ownership changes.

Glossary

Depth of Crimp: Thickness of the crimped portion of a connector measured between two opposite points on the crimped surface.
Derating Factor: A factor used to reduce the current carrying capacity of a wire when used in environments other than that for which the value was established.
Detector: (fiber optic) A device that picks up light from fiber and converts the information into an electrical signal.
Device, As Related to a Work Station: An item such as a telephone, personal computer, or graphic or video terminal.
Device, As Related to Protection: A protector, a protector mount, a protector unit, or a protector module.
Dielectric: An insulating medium which intervenes between two conductors and permits electrostatic attraction and repulsion to take place across it.
Dielectric Breakdown: The voltage required to cause an electrical failure or breakthrough of the insulation.
Dielectric Constant (K): The ratio of the capacitance of a condenser with dielectric between the electrodes to the capacitance when air is between the electrodes. Also called Permittivity and Specific Inductive Capacity.
Dielectric Loss: Power dissipated in an insulating medium as the result of the friction caused by molecular motion when an AC electric field is applied.
Dielectric Strength: The voltage which an insulation can withstand before breakdown occurs. Usually expressed as a voltage gradient (such as volts per mil).
Dielectric Test: A test in which a voltage higher than the rated voltage is applied for a specified time to determine the adequacy of the insulation under normal conditions.
Digital: Transmission data representative by discrete characters.
Dip Coating: An insulating coating applied to the conductor by passing the conductor through an applicator containing liquid insulating medium.
Direct Burial Cable: A cable installed directly in the earth.
Direct Capacitance: The capacitance measured directly from conductor to conductor through a single insulating layer.
Direct Current (d.c.): An electric current which flows in only one direction.
Direct Current Resistance (DCR): The resistance offered by any circuit to the flow of direct current.
Direction of Lay: The lateral direction in which the strands of a conductor run over the top of the cable conductor as they recede from an observer looking along the axis of the conductor or cable. Also applies to twisted cable.
Discrete Wiring: Wire or wires having distinct identity and purpose.
Dispersion: (fiber optic) The variation of the refractive index of a material with wavelength, causing light of different wavelengths to travel at different velocities in the material.
Disruptive Discharge: A sudden, large increase in current through an insulation medium due to the complete failure of the medium under the electrostatic stress.
Dissipation Factor: The tangent of the loss angle of the insulating material. (Also referred to as loss tangent, tan δ, and approximate power factor.)
Distribution Cable: In telecommunications and CATV systems, the transmission cable between the distribution amplifier and the drop wire.
Distribution Frame: A structure with terminations for connecting the permanent cabling of a facility in such a manner that interconnection or cross-connections may be readily made.
Disturbed Conductor: A conductor that receives energy generated by the field of another conductor or an external source such as a transformer.
Drain Wire: In a cable, the uninsulated wire laid over the component or components and used as a ground connection.
Draw Feed Stock: Rod or wire that is subsequently drawn to a smaller size.
Drawing: In wire manufacture, pulling the metal through a die or series of dies to reduce diameter to a specified size.
Drop Ceiling: See False Ceiling.
Drop Wire: In telecommunications and CATV systems, the transmission cable from the distribution cable to a dwelling.
Dual Coaxial Cable: Two individually insulated conductors laid parallel or twisted and placed within an overall shield and sheath.
Duct: a) A single enclosed raceway for wires or cables. See also Conduit, Raceway; b) a single enclosed raceway for wires or cables usually used in soil or concrete, c) an enclosure in which air is moved. Generally part of the HVAC system of a building.
Duplex: Two way data transmission on a four-wire transmission line or two fiber.
Duplex Cable: (1) A cable composed of two insulated single conductor cables twisted together. (2) A cable composed of two fibers, typically 62.5/125 μm Multi-Mode, placed in parallel under a thermoplastic sheath.
Duplex Parallel: Typically used in the thermocouple industry to denote two parallel conductors of dissimilar metals insulated in parallel without twist and jacketed. Commonly applied to thermocouple grades and extension wires.
Eccetricity: Like concentricity, a measure of the center of a conductor's location with respect to the circular cross section of the insulation. Expressed as a percentage of displacement of one circle within the other.
Eddy Current: Circulating currents induced in conducting materials by varying magnetic fields.
Elastomer: A rubber or rubber-like material which will stretch repeatedly to 200 percent or more and return rapidly and with force to its approximate original shape.
Electro-Tinned: Electrolytic process of tinning wire using pure tin.
Electrode: A conductor through which a current enters or leaves a nonmetallic conductor.
Electromagnetic Coupling: Energy transfer by means of a varying magnetic field.
Electromagnetic Field: A rapidly moving electric field and its associated moving magnetic field.
Electromagnetic Induction: The production of a voltage in a coil due to a change in the number of magnetic lines of forces (flux linkages) passing through the coil.
Electromagnetic Interference (EMI): The interference in signal transmission or reception resulting from the radiation of electrical and magnetic fields. Synonym: Radio Frequency Interference.
Electromotive Force (e.m.f.): Pressure or voltage. The forces which cause current to flow in a circuit.
Electronic Wire and Cable: A length of conductive or semiconductive material used in an electronic application.
Electrostatic: Pertaining to static electricity, or electricity at rest. An electric charge, for example.
Elongation: The fractional increase in the length of a material stressed in tension.
Embossing: A marker identification by means of thermal indentation leaving raised lettering on the sheath material of cable.
Emergency Overload: Load which occurs when larger than normal currents are carried through a cable or wire over a certain period of time.
Enameled Wire: A conductor with a baked-on enamel film insulation. In addition to magnet wire, enameled insulation is used on thermocouple type wires and other wires.
Ends: In braiding, the number of essentially parallel wires of threads on a carrier.
Energize: To apply rated voltage to a circuit or device in order to activate it.
Entrance Facility, Telecommunications: An entrance to a building for both public and private network service cables (including antennae) including the entrance point at the building wall and continuing to the entrance room or space.
Entrance Point, Telecommunications: The point of emergence of telecommunications conductors through an exterior wall, a concrete floor slab, or from a rigid metal conduit or intermediate metal conduit.
Entrance Room or Space, Telecommunications: A space in which the joining of inter- or intra-building telecommunications backbone facilities takes place. An entrance room may also serve as an equipment room.
Equilay: More than one layer of helically laid wires with the direction of lay reversed for successive layers, but with the length of lay the same for each layer.
Equipment Room, Telecommunications: A centralized space for telecommunications equipment that serves the occupants of the building. An equipment room is considered distinct from a telecommunications closet because of the nature of complexity or the equipment.
Etched Wire: A process applied to fluoroplastic wire in which the wire is passed through a sodium bath to create a rough surface to allow epoxy resin to bond the fluoroplastic.
Exit Angle: The angle between the output radiation vectors and the axis of the fiber or fiber bundle.
External Interference: The effects of electrical waves or fields which cause sounds other than the desired signal. Static.

Glossary

External Wiring: Electronic wiring which interconnects subsystems within the system.
Extruded Cable: Cable with conductors which are uniformly insulated and formed by applying a homogeneous insulation material in a continuous extrusion process.
Extrusion: Method of continuously forcing plastic, rubber, or elastomer material through an orifice to apply insulation or jacketing over a conductor or cable core.
False Ceiling: A ceiling that creates an area or space between the ceiling material and the structure above the material. Synonym: Drop Ceiling, Suspended Ceiling.
Farad: A unit of electrical capacity.
Fatigue Resistance: Resistance to metal crystallization which leads to conductors or wires breaking from flexing.
Feed-Through Insulators: Insulators that carry a metal conductor through the chassis while preventing the 'hot' lead from shorting to the ground chassis.
Feedback: Energy that is extracted from a high-level point in a circuit and applied to a lower level. Positive feedback reduces the stability of a device and is used to increase the sensitivity or produce oscillation in a system. Negative feedback, also called inverse feedback, increases the stability of a system as the feedback improves stability and fidelity.
Feeder Cable: In telecommunication or CATV systems, the transmission cable from the head end (signal pickup) to the trunk amplifier. Also called a trunk cable.
Feedthrough: (1) A conductor that connects patterns on opposite sides of a PCB. Also called Interfacial connection. (2) A connector or terminal block, usually having double-ended terminals which permit simple distribution and bussing of electrical circuits.
Ferrous: Composed of and/or containing iron. A ferrous metal exhibits magnetic characteristics.
Ferrule: A short tube used to make solderless connections to shielded or coaxial cable.
Fiber: A thread or threadlike structure. Also, a single discrete element used to transmit optical (light wave) information.
Fiber Dispersion: (fiber optic) Pulse spreading in a fiber caused by differing transit times of various modes.
Fiber Optics: A lightwave or optical communications system in which electrical information is converted to light energy, transmitted to another location through optical fibers, and is there converted back into electrical information.
Fiber Tubing: A loose, crush-resistant cylinder applied over individual fibers to provide mechanical protection.
Field: An area of influence around a magnet or electric charge.
Field Coil: A suitable insulated winding to be mounted on a field pole to magnetize it.
Figure 8 Cable: An aerial cable configuration in which the conductors and the steel strand which supports the cable are integrally jacketed. A cross section of the finished cable approximates the figure "eight."
Filament: Fiber characterized by extreme length.
Filled Cable: A telephone cable construction in which the cable core is filled with a material that will prevent moisture from entering or passing through the cable.
Filler: (1) A material used in multiconductor cables to occupy large interstices formed by the assembled conductors. (2) An inert substance added to a compound to improve properties or decrease cost.
Film: A thin plastic sheet.
Fine Stranded Wire: Stranded wire with component strands of 36 AWG or smaller.
Firestop: A material, device, or assembly of parts installed in a cable system in a fire-rated wall or floor to prevent passage of flame, smoke, or gasses through the rated barrier.
Flame Resistance: The ability of a material not to propagate flame once the heat source is removed.
Flammability: The measure of the material's ability to support combustion.
Flashover: A disruptive discharge around or over the surface of a solid or liquid insulator.
Flat Braid: A woven braid of tinned copper strands rolled flat at time of manufacture to a specified width.
Flat Cable: A cable with two smooth or corrugated but essentially flat surfaces.
Flat Conductor: A wire having a rectangular cross section as opposed to a round or square conductor.
Flat Conductor Cable: A cable with a plurality of flat conductors.
Flex Life: The measurement of the ability of a conductor or cable to withstand repeated bending.
Flexibility: The ease with which a cable may be bent.
Flexible: That quality of a cable or cable component which allows for bending under the influence of outside force, as opposed to limpness which is bending due to the cable's own weight.
Floating: Referring to a circuit which has no connection to ground.
Flux: (1) The lines of force which make up an electrostatic field. (2) The rate of flow of energy across or through a surface. (3) A substance used to promote or facilitate fusion.
FNC: Federal Networking Council (formerly FRICC).
Foamed Plastics: See Cellular Plastic.
Foil: A thin, continuous sheet of metal.
Free Connector: A connector for attachment to the free end of a wire or cable.
Frequency: The number of times a periodic action occurs in a unit of time. The number of cycles that an electric current completes in 1 second.
Frequency Response: The characteristic of a device denoting the range of frequencies over which it may be used effectively.
Funnel Entry: Flared or widened entrance to a terminal or connector wire barrel.
Fuse Wire: Wire made from an alloy that melts at a relatively low temperature.
Fused Coating: A metallic coating which has been melted and solidified, forming a metallurgical bond to the base material.
Fused Conductors: Individual strands of heavy tinned copper wire stranded together and then bonded together by induction heating.
Fused Spiral Tape: A PTFE insulated hookup wire. The spiral wrapped conductor is passed through a sintering oven where overlaps are fused together.
Gain: The increase of voltage, current, or power over a standard or previous reading. Usually expressed in decibels.
Galvanometer: An instrument for detecting or measuring small electrical current.
Gas Filled Cable: A self-contained pressure cable in which the pressure medium is an inert gas having access to the insulation.
Gauge: A term used to denote the physical size of a wire.
Giga: A numerical prefix denoting one billion (10^9).
Gigahertz (GHz): A unit of frequency equal to one billion hertz.
Gimmick: A short length of wire soldered onto a circuit component and used as a small adjustable capacitor.
Graded-Index: A type of optical fiber in which the refractive index of the core is in the form of a parabolic curve, decreasing toward the cladding. This type of fiber provides high bandwidth capabilities.
Ground: A conducting connection, whether intentional or accidental, between an electrical circuit (e.g. telecommunications) or equipment and the earth, or to some conducting body that serves in place of the earth.
Ground Conductor: A conductor in a transmission cable or line that is grounded.
Ground Insulation: The insulation used between a winding and the magnetic core or other structural parts, usually at ground potential.
Ground Loop: The generation of undesirable current flow within a ground conductor, owing to the circulation currents which originate from a second source of voltage.
Ground Plane: Expanded copper mesh which is laminated into some flat cable constructions as a shield.
Ground Potential: Zero potential with respect to the ground or earth.
Hard Drawn Copper Wire: Copper wire that has not been annealed after drawing.
Harness: An arrangement of wires and cables usually with many breakouts, which have been tied together or pulled into a rubber or plastic sheath, used to interconnect an electric circuit.
Hash Mark Stripe: A non-continuous helical stripe applied to a conductor for identification.
Heat Distortion: Distortion of flow of a material or configuration due to the application of heat.
Heat Seal: Method of sealing a tape wrap jacket by means of thermal fusion.
Heater Cord: Flexible stranded copper conductor, cotton wrapped, with rubber insulation and asbestos roving.
Helical Stripe: A continuous, colored, spiral stripe applied to a conductor for circuit identification.
Helix: Spiral winding.
Henry: The unit of inductance.
Hertz (Hz): A term replacing cycles-per-second as an indication of frequency.
Heterogeneous Insulation: A cable insulating system composed of two or more layers of different insulating materials.

Glossary

High Temperature Wire and Cable: Electrical wire and cables having thermal operating characteristics of 150°C and higher.
High Voltage: Generally, a wire or cable with an operating voltage of over 600 volts.
Holding Strength: Ability of a connector to remain assembled to a cable when under tension.
Homogeneous Insulation: A complete cable insulation structure whose components cannot be identified as layers of different materials.
Hook-up Wire: A wire used for low current, low voltage (under 1000 volts) applications within enclosed electronic equipment.
Horizontal Cabling: The wiring/cabling between the telecommunications outlet/connector and the horizontal cross-connect.
Horizontal Cross-Connect: A cross-connect of horizontal cabling to other cabling, e.g. horizontal, backbone, or equipment.
Hot Stamping: Method of alpha numerical coding. Identification markings are made by pressing heated type and marking foil into softened insulation surfaces. See Surface Printing.
Hot Tin Dip: A process of passing bare wire through a bath of molten tin to provide a coating.
Hybrid Cable: An assembly of 2 or more cables (of the same or different types or categories) covered by one overall sheath.
Hygroscopic: Capable of absorbing moisture from the air.
Hypalon: DuPont's trade name for their chlorosulfonated polyethylene, an ozone resistant synthetic rubber.
Impact Tool: Device used to punch new conductor onto ID's. This tool is typically equipped with a cutting blade for either 66 or 110 blocks.
Impedance: The total opposition that a circuit offers to the flow of alternating current or any other varying current at a particular frequency. It is a combination of resistance R and reactance X, measured in Ω.
Impedance Matching Transformer: A transformer designed to match the impedance of one circuit to that of another (BALUN).
Impulse: A surge of unidirectional polarity.
Impulse Strength: The voltage breakdown of insulation under voltage surges on the order of microseconds in duration.
Impulse Test: An insulation test in which the voltage applied is an impulse voltage of specified wave shape.
Incoherent Source: (fiber optic) A light source which emits wide, diffuse beams of light of many wave lengths.
Index Matching Fluid: (fiber optic) Fluid with refractive index same as fiber core; used to fill air gap between fiber ends at connectors.
Index of Refraction: The ratio of light velocity in a vacuum to its velocity in a given transmitting medium.
Inductance: The property of a circuit or circuit element that opposes a change in current flow, thus causing current changes to lag behind voltage changes. It is measured in henrys.
Inductive Coupling: Crosstalk resulting from the action of the electromagnetic field of one conductor on the other.
Infrastructure, Telecommunications: A collection of those telecommunications components, excluding equipment, that together provide the basic support for the distribution of all information within a building or campus.
Insertion Loss: As measure of the attenuation of a device by determining the output of a system before and after the device is inserted into the system.
Insertion Tool: A small, hand-held tool used to insert contacts into a connector.
Insulated Wire: A conductor of electricity covered with a non-conducting material.
Insulating Joint: A device which mechanically couples and electrically insulates the sheath and armor of contiguous lengths of cable.
Insulation: A material having high resistance to the flow of electric current. Often called a dielectric in radio frequency cable.
Insulation Adhesion: The degree of tightness of the insulation over the base conductor, measured in terms of force required to remove a specified length of insulation from the wire.
Insulation Crimp: The area of a terminal, splice or contact that has been formed around the insulation of the wire.
Insulation Grip: Extended cylinders at the rear of crimp-type contacts designed to accept the bared wire and a small length of its insulation.
Insulation Piercing: A method of crimping whereby lances cut the insulation of the wires and enter into the strands to make electrical contact.
Insulation Resistance: The ratio of the applied voltage to the total current between two electrodes in contact with a specific insulation, usually expressed in megΩ-M feet.
Insulation System: All of the insulation materials used to insulate a particular electrical or electronic product.
Integral Belt: A layer of insulation or semiconductive material applied by extrusion over two or more insulated, twisted or parallel conductors, to form a round smooth diameter.
Interconnect: A connection scheme that provides for the direct connection of individual cables to another cable or to an equipment cable without a patch cord.
Interconnecting Cable: The wiring between modules, between units, or the larger portions of a system.
Interconnecting Wire: The physical wiring between components (outside a module), between modules, between units or between larger portions of a system or systems.
Interconnection: Mechanically joining devices together to complete an electrical circuit.
Interface: The two surfaces on the contact side of both halves of a multiple-contact connector which face each other when the connector is assembled.
Intermediate Cross-Connect: A cross-connect between 1st level and 2nd level backbone cabling.
Internal Wiring: Electronic wiring which interconnects components, usually within a sealed subsystem.
Interstices: Voids or valleys between individual strands in a conductor or between insulated conductors in a multiconductor cable.
Ionization Voltage (Corona Level): The minimum value of falling rms voltage which sustains electrical discharge within the vacuous or gas-filled spaces in the cable construction or insulation.
Irradiation: In insulations, the exposure of the material to high energy emissions for the purpose of favorably altering the molecular structure.
Jack: A plug-in type terminal widely used in an electronic apparatus for temporary connections.
Jacket: An outer protective sheath over primary insulation, braids, shields, cable components, or over the cable itself. In fiber optics, a covering, over a fiber, bundle of fibers, or cable which protects against the environment.
JAN Specification: Joint Army-Navy specification (replaced by current Military Specifications).
Jumper: An assembly of twisted pairs without connectors, used to join telecommunications circuits/links at the cross connect.
Junction: A point in a circuit where two or more wires are connected.
Keying: The mechanical feature of a connector system that guarantees correct orientation of a connection, or prevents the connection to a jack, or to an optical fiber adapter of the same type intended for another purpose.
Kynar: Pennwalt trade name for polyvinylidene fluoride. Typically used as insulation for wire wrap wire.
Lacing and Harnessing: A method of grouping wires by securing them in bundles of designated patterns.
Lacquer: A liquid resin or compound applied to textile braid to prevent fraying, moisture absorption, etc.
Laminated Tape: A tape consisting of two or more layers of different materials bonded together.
Laser Diode: (fiber optic) A semiconductor diode that, when pulsed, a laser diode emits coherent light.
Launch Angle: (fiber optic) The angle between the radiation vector and the axis of the fiber or fiber bundle.
Lay: The length measured along the axis of a wire or cable required for a single strand (in stranded wire) or conductor (in cable) to make one complete turn about the axis of the conductor or cable.
Layer: Consecutive turns of a coil lying in a single plane.
Leaching and Non-Leaching: In a leaching wire the plasticizer will migrate when exposed to heat. A non-leaching wire will retain its plasticizer under extreme temperature conditions and remain flexible after baking.
Lead: A wire, with or without terminals, that connects two points in a circuit.
Lead Cured: A cable that is cured or vulcanized in a metallic lead mold.
Lead Dress: The placement or routing of wire and component leads in an electrical circuit.
Lead-in: The conductor or conductors that connect the antenna proper to electronic equipment.
Leakage Current: The undesirable flow of current through or over the surface of an insulation.

Glossary

Life Cycle: A test to determine the length of time before failure in a controlled, usually accelerated, environment.
Light Commercial Building: A building or portion thereof that is intended for use with one to four (1-4) non-residential exchange access lines per tenant.
Light-Intensity Ratio: (fiber optic) Ratio of input light intensity to the output light intensity.
Light Source: (fiber optic) An object capable of emitting light. In fiber optics, the light source is normally an LED or a laser.
Lightguide: (fiber optic) A flexible bundle of fibers used to transmit light.
Lightwave Communications: (fiber optic) Communications using light to carry the information.
Limits of Error: The maximum deviation (in degrees of percent) of a thermocouple or thermocouple extension wire from standard emf-temperature to be measured.
Limpness: The ability of a cable to lay flat or conform to a surface.
Line Balance: The degree to which the conductors of a cable are alike in their electrical characteristics with respect to each other, to other conductors, and to ground.
Line Drop: A voltage loss occurring between any two points in a transmission line, due to the resonance, reactance, or leakage of the line.
Line Loss: The total of the various energy losses occurring in a transmission line.
Line Voltage: Voltage existing in a cable or circuit.
Link: An assembly of telecommunications facilities between two points, not including terminal equipment.
Listed: Equipment included in a list published by an organization, acceptable to the authority having jurisdiction, that maintains periodic inspection of production of listed equipment, and whose listing states either that the equipment or material meets appropriate standards or has been tested and found suitable for use in a specified manner.
Local Area Network (LAN): A geographically limited communications network intended for the local transport of data, video, and voice.
Longitudinal Shield: A tape shield, flat or corrugated, applied longitudinally with the axis of the core being shielded.
Longitudinal Wrap: Tape applied longitudinally with the axis of the core being covered.
Loop Resistance: The total resistance of two conductors measured round trip from one end. Commonly used term in the thermocouple industry.
Looping-in: Wiring method which avoids tee joints by carrying the conductor or cable to and from the point to be supplied.
Loss: Energy dissipated without accomplishing useful work.
Loss Factor: The product of the dissipation and dielectric constant of an insulating material.
Lossy Line: A cable having large attenuation per unit of length.
Low Loss Dielectric: An insulating material that has a relatively low dielectric loss, such as polyethylene or Teflon.
Low Noise Cable: Cable configuration specially constructed to eliminate spurious electrical disturbances caused by capacitance changes or self-generated noise induced by either physical abuse or adjacent circuitry.
Low Tension: Low voltage, as applied to ignition cable.
Lug: Termination, usually crimped or soldered to the conductor, with provision for screwing on to the terminal.
m: Meter.
Magnet Wire: Insulated wire intended for use in windings on motor, transformer, and other coils for electromagnetic devices.
Magnetic Field: The region within which a body or current experiences magnetic force.
Magnetic Flux: The rate of flow of magnetic energy across or through a surface (real or imaginary).
Magnetic Noise: Caused by change in current level, e.g. ac powerline (creates magnetic field around the cable) this magnetic field causes the magnetic noise.
Main Cross-Connect: A cross-connect for 1st level backbone cables, entrance cables, and equipment cables.
Marker Tape: A tape laid parallel to the conductors under the sheath in a cable, imprinted with the manufacturer's name and the specification to which the cable is made.
Master Antenna Television (MATV): A combination of components providing multiple television receiver operations from one antenna or group of antennas normally on a single building.
Material Scattering Loss: (fiber optics) Loss due to fluctuations in the refractive index and to inhomogeneities in material composition and temperature.
Media, Telecommunications: Wire, cable, or conductors used for telecommunications.
Megarad: A unit for measuring radiation dosage.
Messenger: Supporting member, usually a high strength steel wire, used to suspend aerial cable. The messenger may be an integral part of the cable, or exterior to it (lashed messenger).
Microbending Loss: (fiber optic) Loss due to small geometrical irregularities along the core-clad interface of the fiber.
Microfarad: One-millionth of a farad, commonly abbreviated mF.
Micromicrofarad: One-millionth of a microfarad. (uuf, uufd, mmf, mmfd $\mu\mu$F are common abbreviations.)
Microwave: A short (usually less than 30 cm.) electrical wave.
Mil: A unit used in measuring diameter of a wire or thickness of insulation over a conductor. One-one thousandth of an inch (.001").
Mineral Insulated: Cable and thermocouple wire consisting of one or more conductors surrounded by magnesium oxide insulation and enclosed in a liquid-and-gas-tight metallic sheathing.
Miniature Wire: Insulated conductors of approximately 20-34 AWG.
Mis-Match: A termination having a different impedance than that for which a circuit or cable is designed.
Mode: One of the components of a general configuration of a propagating wave front.
Modem: Device which places and receives data signals over a common carrier's communication facility.
Modular Jack: This term is outmoded, see Outlet/Connector, Telecommunications.
Modular Plug: A telecommunications connector for wire or cords per the Part 68 Rules. A modular plug can have 6 or 8 contact positions, but not all the positions need be equipped with contacts.
Modulation: A process whereby certain characteristics of a wave, often called the carrier, are varied or selected in accordance with a modulating function.
Modulus of Elasticity: The ratio of stress to strain in an elastic material.
Moisture Absorption: The amount of moisture, in percentage, that a material will absorb under specified conditions.
Moisture Resistance: The ability of a material to resist absorbing moisture from the air or when immersed in water.
Molded Plug: A connector molded on either end of a cord or cable.
Monomer: The basic chemical unit used in building a polymer.
Motor Lead Wire: Wire which connects to the fragile magnet wire found in coils, transformers, and stator or field windings.
Multiconductor: More than one conductor within a single cable complex.
Multimode Optical Fiber: An optical fiber that will allow many bound modes to propagate. The fiber may be either a graded-index or step-index fiber. See also: Optical Fiber Cable.
Multiple Conductor Cable: A combination of two or more conductors cabled together and insulated from one another and from sheath or armor where used.
Multiple Conductor Concentric Cable: An insulated central conductor with one or more tubular stranded conductors laid over it concentrically and insulated from one another.
Multiplexing: Simultaneous transmission of two or more messages over the same cable pair.
Mutual Capacitance: Capacitance between two conductors when all other conductors are connected together to shield and ground.
Mylar®: DuPont trademark for polyester film.
Nanometer (nm): One billionth of a meter (10^{-9} meter).
Nanosecond: One billionth of a second (10^{-9} seconds).
National Electric Code (NEC): A set of regulations governing construction and installation of electrical wiring and apparatus in the United States, established by the American National Board of Fire Underwriters.
Neoprene: A synthetic rubber with good resistance to oil, chemical, and flame. Also called polychloroprene.
Noise: In a cable or circuit, any extraneous signal which tends to interfere with the signal normally present in or passing through the system.
Nomex®: DuPont trademark for a temperature resistant, flame-retardant nylon.
Non-Contaminating: Type of PVC jacket material whose plasticizer will not migrate into the dielectric of a coaxial cable and thus avoids contaminating and destroying the dielectric.

Glossary

Nylon: Thermoplastic with good chemical and abrasion resistance.
NVP: Nominal Velocity of Propagation.
Off Center: Conductor displaced within the cross-section of its insulation.
Offgassing: Percentage of a specified gas released during the combustion of insulation or jacketing material.
Ohm: A unit of electrical resistance.
Oil Aging: Cable aged in an accelerated manner by placement in an oil bath and heated to a pre-set temperature for a stated time.
Oil-Filled Cable: A self-contained pressure cable in which the pressure medium is low viscosity oil having access to the insulation.
Opaque: (fiber optic) Not permitting the passage of light.
Open Cell: Foamed or cellular material with cells which are generally interconnected.
Optical Communication Cable: (fiber optic) Fiber with a protective jacket around it.
Optical Conductors: (fiber optic) Materials which offer a low optical attenuation to transmission of light energy.
Optical Fiber Cable: An assembly consisting of one or more optical fibers.
Optical Fiber Duplex Adapter: A mechanical media termination device designed to align and join two duplex connectors.
Optical Fiber Duplex Connector: A mechanical media termination device designed to transfer optical power between two pairs of optical fibers.
Optical Waveguide: (fiber optic) A fiber used for optical communications. Analogous to a waveguide used for microwave communications.
Oscillatory Surge: A surge which includes both positive and negative polarity values.
Outgassing: The dissipation of gas from a dielectric evidencing decomposition.
Outlet Box, Telecommunications: A metallic or nonmetallic box mounted within a wall, floor, or ceiling and used to hold telecommunications outlet/connectors or transition devices.
Outlet/Connector, Telecommunications: A connecting device in the work area on which horizontal cable terminates.
Overall Diameter: Finished diameter over wire or cable.
Overcoat Conductor: A stranded conductor made from individual strands of tin coated wire stranded together, and then given an overall tin coat.
Overlap: The amount the trailing edge laps over the leading edge of a spiral tape wrap.
Oxygen Index: Percentage of oxygen necessary to support combustion in a gas mixture.
Ozone: Reactive form of oxygen, typically found around electrical discharges and present in the atmosphere in small quantities.
Packing Fraction: (fiber optic) The ratio of active cross-sectional area of fiber core, or cores, to the total end surface of the fiber, or fiber bundle.
Pair: Two insulated wires of a single circuit associated together, also known as a "balance" transmission line.
Parallel Pair: A duplex construction of two insulated conductors laid parallel and then covered overall with a braid or jacket.
Parallel Stripe: A stripe applied longitudinally on a wire or cable parallel to the axis of the conductor.
Patch Cord: A length of cable with connectors on one or both ends used to join telecommunications links/circuits at the cross-connect.
Patch Cord Cable: Bulk cable used in the manufacture of patch cords.
Patch Panel: A cross-connect system of mateable connectors that facilitates administration.
Pathway: A facility for the placement of telecommunications cable. Synonym: Raceway.
Pay-Off: The process of feeding a cable or wire from a bobbin, reel, or other package.
Percent Plating: Quantity of plating on a conductor expressed as a percentage by weight.
Percentage Conductivity: Conductivity of a material expressed as a percentage of that of copper.
Periodicity: The uniformly spaced variations in the insulation diameter of a transmission cable that result in reflections of a signal, when its wavelength or a multiple thereof is equal to the distance between two diameter variations.
Permittivity: See Dielectric Constant.
Phase: An angular relationship between waves.
Phase Shift: A change in the phase relationship between two alternating quantities.
Photodetector (Receiver): Converts light energy to electrical energy.
Pick: Distance between two adjacent crossover points of braid filaments. The measurement in picks per inch indicates the degree of coverage.
Picofarad: One-millionth of one-millionth of a farad. A micromicrofarad or picofarad (abbreviation pf). (See $\mu\mu$F).
Pigtail Wire: Fine stranded, extra flexible, rope lay lead wire attached to a shield for terminating purposes.
Pitch: In flat cable, the nominal distance between the index edges of two adjacent conductors.
Pitch Diameter: Diameter of a circle passing through the center of the conductors in any layer of a multiconductor cable.
Plain Conductor: A conductor consisting of only one metal.
Plain Weave: A weave used on woven cables. Threads between the wires act as binders and give the cable lateral stiffness and linear flexibility. Also called Standard and Square weave.
Planetary Cabler: A cabler capable of laying down any number of shielded, overbraided, or jacketed singles, pairs, called groups, or any combination of them in sequence.
Planetary Twister: A twisting machine whose payoff spools are mounted in rotating cradles that hold the axis of the spool in a fixed direction as the spools are revolved so no twist is built up in each wire.
Plastic Deformation: Change in dimensions under load that is not recovered when the load is removed.
Plasticizer: A chemical agent added to plastics to make them softer and more pliable.
Plenum: The air return path of a central air handling system, either ductwork or open space over a suspended ceiling.
Plenum Cable: Cable approved by a recognized agency such as UL for installation in plenums without the need for conduit.
Plug: The part of the two mating halves of a connector which is moveable when not fastened to the other mating half.
Ply: The number of individual strands or filaments twisted together to form a single thread.
Point-to-Point: A type of connection established between two specific locations, as between two buildings.
Point-to-Point Wiring: An interconnecting technique wherein the connections between components are made by wires routed between connecting points.
Polarization: The orientation of a flat cable or a rectangular connector.
Polishing: (fiber optic) Act of smoothing ends of fibers to an 'optically smooth' finish, generally using abrasive.
Polyester: Polyethylene terephthalate, used extensively as a moisture resistant cable core wrap.
Polyethylene: A thermoplastic material having excellent electrical properties.
Polyhalocarbon: A general name for polymers containing halogen atoms. The halogens are fluorine, chlorine, bromine, and iodine.
Polymer: A material of high molecular weight formed by the chemical union of monomers.
Polyolefin: Any of the polymers and copolymers of the ethylene family of hydrocarbons.
Polypropylene: A thermoplastic similar to polyethylene but stiffer and having higher softening point (temperature); excellent electrical properties.
Polyurethane: Class of polymers known for good abrasion and solvent resistance (may be applied in solid or cellular form).
Porosity: Multiple voids in an insulation cross-section.
Potting: The sealing of a cable termination or other component with a liquid which thermosets into an elastomer.
Power Cables: Cables of various sizes, construction, and insulation, single or multi-conductor designed to distribute primary power to various types of equipment.
Power Factor: The ratio of resistance to impedance. The ratio of the actual power of an alternating current to apparent power. Mathematically, the cosine of the angle between the voltage applied and the current resulting.
Pre-Bond: Stranded wire which has been fused, topcoat tinned, or overcoat tinned.
Prewiring: Wiring installed
- Before walls are enclosed or finished.
- In anticipation of future use or need.

Primary: The transformer winding which receives the energy from a supply circuit.
Primary Insulation: The first layer of non-conductive material applied over a conductor, whose prime function is to act as electrical insulation.
Primary Protection: The minimum protection required on all exposed facilities to comply with NEC requirements.
Primary Wiring: A printed circuit intended to provide point-to-point electrical connections.
Programming: Ability to select various circuit patterns by interconnecting appropriate contacts on one side of a connector plug or panel.
Propagation Delay: Time delay between input and output of signal.

Glossary

Propagation Time: Time required for a wave to travel between two points on a transmission line.
Protocol: A set of rules for communicating.
Proximity Effect: Nonuniform current distribution over the cross-section of a conductor caused by the variation of the current in a neighboring conductor.
Pull Box: A device to access a raceway used to facilitate placing of wire or cables.
Pull Cord/Pull Wire: Cord or wire placed within a raceway and used to pull wire and cable through the raceway.
Pull Strength: See Pull Tension.
Pull Tension: The maximum pulling force that can be safely applied to a cable without damage.
Pulling Eye: A device used to pull cable into or from a duct.
Pulse: Energy which changes abruptly from an intensity to another. May be light energy or electrical energy.
Pulse Cable: A type of coaxial cable constructed to transmit repeated high voltage pulses without degradation.
Polyvinyl Chloride (PVC): A general purpose thermoplastic widely used for wire and cable insulations and jackets.
Quad: A series of four separately insulated conductors, generally twisted together in pairs. Also, a series-parallel combination of transistors with increased reliability because failure of one transistor will not disable the entire circuit.
Quadders: Three-bay machines which can twist four wires together and cable braided and shielded wires with varying lay lengths.
Raceway: Any channel designed for holding wires or cables, e.g. conduit, electrical metallic tubing, sleeves, slots, underfloor raceways, cellular floors, surface raceways, lighting fixture raceways, wireways, cable troughs, busways, auxiliary gutters, and ventilated flexible cableways. Synonym: Pathway.
Rack: See: Cable Rack.
Radio Frequency: The frequencies in the electromagnetic spectrum that are used for radio communications.
Random Winding: A winding in rotating equipment wherein the wires do not lie in an even pattern.
Reactance: The opposition offered to the flow of alternating current by inductance or capacitance of a compound or circuit.
Red Plaque: A powdery, brown-red growth found on silvercoated copper conductors and shield braids.
Redraw: The consecutive drawing of wire through a series of dies to reach a desired wire size.
Reducing Joint: A joint between two lengths of cable where the conductors are not the same size.
Reel: A revolvable flanged device made of wood or metal, used for winding flexible metal wire or cable.
Reflection: (fiber optic) Change in direction of a light wave or ray.
Reflection Loss: The part of a signal which is lost due to reflection of power at a line discontinuity.
Refraction: (fiber optic) The bending of lightwaves or rays as they go from one material to another due to the difference in velocities in the materials.
Reinforced Sheath: The outmost covering of a cable that has cable sheath constructed in layers with the addition of a reinforcing material, usually a braided fiber, molded in place between layers.
Remanence: The magnetic induction that remains in a magnetic circuit after the removal of an applied magnetomotive force.
Repeater: A device which consists of a transmitter and a receiver or transmitter, used to regenerate a signal to increase the system transmission length.
Resistance: A measure of the difficulty in moving electrical current through a medium when voltage is applied. It is measured in Ω.
Resistive Conductor: A conductor with high electric resistance.
Retractile Cord: A cord having specially treated insulation or jacket so that it will retract.
Return Wire: A ground wire or the negative wire in a direct-current circuit.
Ribbon Cable: A flat cable of individually insulated conductors lying parallel and held together by means of adhesive or woven textile yarn.
Ridge Marker: One or more ridges running laterally along the outer surface of a plastic insulated wire for purposes of identification.
Rigid Bay: Cabling equipment that maintains component sequence, and can produce cables with distinct layers.
Rigid Coaxial Cable: Nonflexible coaxial cable, usually a metal tube armored coaxial cable.
Ring Tongue: A solderless terminal that connects wire to a stud.
Ringing Out: Locating or identifying specific conductive paths by passing current through selected conductors.
Rip-Cord: 1.) Two or more insulated conductors in a parallel configuration which may be separated to leave the insulation of each conductor intact. 2.) A small filament cord used to rip through the outer cable sheath.
Rope Concentric: A group of standard conductors assembled in a concentric manner.
Rope Lay Conductor: A conductor composed of a central core surrounded by one or more layers of helically laid groups of wires.
Rope Unilay: A group of stranded conductors assembled in a unilay manner.
Round Wire Shields: Shields constructed from bare, tinned, or silver plated copper wire that include braided, spiral, and reverse spiral.
Routers: A device that determines how to forward a packet toward its destination, based on tables that indicate the costs, congestion status, and other factors associated with possible routes. Also called a level 3 relay or an intermediate system.
Rubber (Wire Insulation): Term used to describe wire insulations made of thermosetting elastomers; occurs naturally or may be made synthetically.
Rulan: DuPont's trade name for their flame retardant polyethylene insulating material.
Screen: A shield placed over the entire core.
Secondary Insulation: A nonconductive material that protects the conductor against abrasion and provides a second electrical barrier.
Segmental Conductor: A stranded conductor consisting of three or more stranded conducting elements, each element having approximately the shape of the sector of a circle, assembled to give a substantially circular cross-section.
Selenium Cure: Process used to cure neoprene and rubber jacketed wires and cables.
Self Extinguishing: Characteristic of a material whose flame is extinguished after the igniting flame source is removed.
Semi-Conducting Jacket: A jacket having a sufficiently low resistance so that its outer surface can be kept at substantially ground potential.
Semi-Rigid: A cable containing a flexible inner core and a relatively inflexible sheathing.
Semi-Solid: An insulation cross-section having a partially open space between the conductor and the insulation perimeter.
Separator: A layer of insulating material which is placed between a conductor and its dielectric between a cable jacket and the components it covers, or between various components of a multiple-conductor cable.
Series Circuit: A circuit in which the components are arranged end to end to form a single path for current.
Serve: A filament or group of filaments such as fibers or wires, wound around a central core.
Serving: A wrapping applied over the core of a cable or over a wire.
Sheath: See Cable Sheath.
Shield: In cables, a metallic layer placed around a conductor or group of conductors to prevent electrostatic or electromagnetic interference between the enclosed wires or external fields.
Shield Coverage: Amount of outer cable covered by the shielding material.
Shield Effectiveness: The ability of a shield to screen out undesirable signals.
Shielded Line: A transmission line whose elements confine propagated radio waves to an essentially finite space inside a tabular conducting surface called the sheath, thus preventing the line from radiating radio waves.
Shielded-Type Cable: A cable in which the surface of the insulation is at ground potential.
Shunt Wire: A conductor joining two parts of an electric circuit to divert part of the current.
Signal: A current used to convey information, either digital, analog, audio, or video.
Silicone: A material made from silicon and oxygen. Can be in thermosetting elastomer or liquid form. The thermosetting elastomer form is noted for high heat resistance.
Silicone Treating: A silicone liquid treatment applied to insulated conductors to allow for easy jacket stripping.
Sine Wave: A wave that can be expressed as the sine of a linear function of time, or space or both.
Single-ended: Unbalanced, such as grounding one side of a circuit or transmission line.
Single-Faced Tape: Fabric tape finished on one side with a rubber or synthetic compound.
Single Mode Fiber: A fiber wave guide in which only one mode will propagate. The fiber has a very small core diameter of approximately 8mm. It permits signal transmission at extremely high bandwidths and is generally used with laser diodes.

Glossary

Sizing: Applying a material to a surface to fill pores.
Skeleton Braid: Widely separated braid of fiber copper, or steel, used to hold core together, for reinforcing jacket or for shielding.
Skew Rays: A ray that does not intersect the fiber axis. Generally, a light ray that enters the fiber core at a very high angle.
Skim Tape: Filled tape coated on one or both sides with a thin film of uncured rubber or synthetic compound to produce a coating suitable for vulcanization.
Skin Effect: The tendency of alternating current, as its frequency increases, to travel only on the surface of a conductor.
Sleeve: A braided, knitted, or woven tube used over wires or components as insulation tubing. Also called Sleeving.
Solid Conductor: A conductor consisting of a single wire.
Source Coupling Loss: (fiber optic) Loss of light intensity as light from source passes into fiber.
Space, Telecommunications: An area used for housing the installation and termination of telecommunications equipment and cable, e.g. telecommunications closets, work areas, and manhole/handholes.
Span: 1.) In flat conductors, distance between the reference edge of the first and the last conductor. 2.) In round conductors, distance between centers of the first and last conductors. 3.) In aerial cable, the distance between poles or support clamps.
Spark Test: A test designed to locate pin-holes in the insulation of a wire or cable by application of a voltage for a very short period of time while the wire is being drawn through the electrode field.
Specific Gravity: The ratio of the density (mass per unit volume) of a material to that of water.
Spectral Bandwidth: The difference between wavelengths at which the radiant intensity of illumination is half its peak intensity.
Spectral Response: (fiber optic) The response of a detector (or a system) over different wavelengths.
Spectrum: Frequencies that exist in a continuous range and have a common characteristic.
Speed of Light (c): 2.998×10^8 meters per second.
Spiral Shield: A metallic shield of fine stranded wires applied spirally rather than braided.
Spiral Stripe: A color coding stripe applied helically to the surface of an insulated wire or cable.
Spiral Wrap: The helical wrap of a tape or thread over a core.
Splice: A joining of conductors generally from separate sheaths.
Splice Closure: A device used to protect a cable or wire splice.
Spread Spectrum: A modulation technique for multiple access, or for increasing immunity to noise and interference.
Standing Wave: The stationary pattern of waves produced by two waves of the same frequency traveling in opposite directions on the same transmission line.
Standing Wave Ratio (SWR): In a transmission line, waveguide, or analogous system, a figure of merit used to express the efficiency of the system in transmitting power.
Star Topology: A topology in which each telecommunications outlet/connector is directly cabled to the distribution device.
Stay Cord: A component of a cable used to anchor the cable ends at their points of termination and to keep any pull of the cable from being transferred to the electrical connections.
Step Index Fiber: (fiber optic) A multimode fiber consisting of a core of uniform refractive index surrounded by cladding of slightly lower refractive index.
Strand: One of the wires of any stranded conductor.
Strand Lay: The distance of advance of one strand of a spirally stranded conductor, in one turn, measured axially.
Stranded Conductor: A conductor composed of groups of wires twisted together.
Strap: Square- or rectangular-section bare conductor manufactured and used in coil form.
Strip: To remove insulation from a cable.
Structural Return Loss: Backward reflected energies from uneven parts of the cable structure causing impedance variations are termed structural return loss.
Surface Resistivity: The resistance of a material between two opposite sides of a unit square of its surface. It is usually expressed in Ω.
Surge: A temporary and relatively large increase in the voltage or current in an electric circuit or cable. Also called Transient.
Suspended Ceiling: See False Ceiling.
Sweep-test: Pertaining to cable, the frequency response is verified by generating an rf voltage whose frequency is swept repeatedly through a given frequency range at a rapid constant rate while the cable response is observed.
Take-Up: The process of accumulating wire or cable onto a reel, bobbin, or some other type of pack. Also, the device for pulling wire or cable through a piece of equipment or machine.
Tank Test: A voltage dielectric test in which the test sample is submerged in water and voltage is applied between the conductor and water as ground.
Tape: A relatively narrow woven or cut strip of fabric, paper, or film material.
Tape Cable: A form of multiple conductor consisting of parallel metal strips imbedded in insulating material.
Tape Wrap: A spirally applied tape over an insulated or uninsulated wire.
Taped Insulation: Insulation of helically wound tapes applied over a conductor or over an assembled group of insulated conductors.
Taping: Process of insulating continuous length, large diameter wires with tape of non-extrudable materials.
TB: Terminal Block
Tear Strength: The force required to initiate or continue a tear in a material under specified conditions.
Teflon®: DuPont Company trade name for fluorocarbon resins. FEP, PFA and TFE are typical materials.
Tefzel: DuPont trade name for a fluorocarbon material typically used as a wire wrap insulation.
Telecommunications: The communication of information over some distance, including interbuilding and intrabuilding distances.
Telecommunications Closet: See Closet, Telecommunications.
Telecommunications Entrance Facility: See Entrance Facility, Telecommunications.
Telecommunications Entrance Point: See Entrance Point, Telecommunications.
Telecommunications Entrance Room or Space: See Entrance Room or Space, Telecommunications.
Telecommunications Equipment Room: See Equipment Room, Telecommunications.
Telecommunications Grounding Busbar: A common point of connection for telecommunications system and bonding to ground, which is located in the telecommunications closet or equipment room.
Telecommunications Infrastructure: See Infrastructure, Telecommunications.
Telecommunications Outlet/Connector: See Outlet/Connector, Telecommunications.
Telemetry Cable: Cable used for transmission of information from instruments to the peripheral recording equipment.
Temperature Rating: The maximum temperature at which an insulating material may be used in continuous operation without loss of its basic properties.
Tensile Strength: The pull stress required to break a given specimen.
Tension Member: A member included in a fiber cable to add tensile strength.
Terminal: a) A point at which information may enter or leave a communications network; b) the input-output associated equipment; or c) a device by means of which wires may be connected to each other.
Termination Hardware: This term is outmoded see Connecting Hardware.
Test Lead: A flexible, insulated lead wire used for making tests, connecting instruments to a circuit temporarily, or for making temporary electrical connections.
Textile Braid: Any braid made from threads of cotton silk, or synthetic fibers.
Thermal Aging: Exposure to a thermal condition or programmed series of conditions for predescribed periods of time.
Thermocouple Lead Wire: An insulated pair of wires used from the couple to a junction box.
Thermoplastic: A material which softens when heated and becomes firm on cooling.
Thermoset: A material which hardens or sets when heat is applied, and which, once set, cannot be resoftened by heating. The application of heat is called “curing.”
Three-Phase Current: Current delivered through three wires, with each wire serving as a return for the other two.
Three-Phase Three-Wire System: An alternating current supply system comprising three conductors over which three-phase power is sent.
Three-Wire System: A d-c or single-phase a-c system comprising three conductors, one of which is maintained at a potential midway between the potential of the other two.
Tin Overcoat (TOC): Tinned copper wire, stranded, then coated with pure tin.

Glossary

Tinsel Wire: A low voltage stranded wire, with each strand a very thin conductor ribbon spirally wrapped around a textile yarn.
Topcoat: Bare (untinned) copper wire, stranded then coated with pure tin.
Topology: The physical or logical arrangement of a telecommunications system.
Tracer: A means of identifying polarity.
Transducer: A device for converting mechanical energy to electrical energy.
Transfer Impedance: The ratio of the source voltage of the wires inside the cable to the shield current of the cable or connectorized cable assembly.
Transition Point: A location in the horizontal cabling where flat undercarpet cable connects to round cable.
Transmission: Transfer of electric energy from one location to another through conductors or by radiation or induction fields.
Transmission Cable: Two or more transmission lines. See Transmission Line.
Transmission Line: An arrangement of two or more conductors or a wave guide used to transfer signal energy from one location to another.
Transmission Loss: The decrease or loss in power during transmission of energy from one point to another. Usually expressed in decibels.
Transmission Media: The various types of wire and optical fiber cable used for transmitting voice or data signals. Typically, wire cable includes twisted pair, coaxial, and twinaxial. Optical fiber cable includes single, dual, quad, stranded, and ribbon (Al).
Transmitter: The electronic package that injects an electrical signal or light signal over the transmission medium.
Transparent: (fiber optic) Transmitting rays of light so that objects can be seen through the material.
Transposition: Interchanging the relative positions of wires to neutralize the effects of induction to or from other circuits or, to minimize interference pickup by the lead-in during reception.
Tray Cable: A factory-assembled multiconductor or multipair control cable approved under the National Electrical Code for installation in trays.
Triaxial: A three-conductor cable with one conductor in the center, a second circular conductor shield concentric with the first, and third circular conductor shield insulated from and concentric with the first and second, usually with insulation, and over a braid or impervious sheath overall.
Triboelectric Noise: Noise generated in a shielded cable due to variations in capacitance between shielding and conductor as the cable is flexed.
Triple Cable: A cable composed of three insulated single conductors and one bare conductor, all twisted together. It may or may not have a common covering of binding.
True Concentric: A cable in which each successive layer has a reversed direction of lay from the preceding layer.
Trunk Cable: See Feeder Cable.
Tubing: A tube of extruded non-supported plastic material.
Twin Cable: A pair of insulated conductors twisted, sheathed, or held together mechanically and not identifiable from each other in a common covering.
Twin Coaxial: A configuration containing two separate, complete coaxial cables laid parallel or twisted around each other in one complex.
Twin Line: A transmission line which has a solid insulating material, in which the two conductors are placed in parallel to each other.
Twinner: A device for twisting together two conductors.
Twisted Pairs: A cable composed of two small insulated conductors twisted together without a common covering.
Unbalanced Line: A transmission line in which voltages on the two conductors are unequal with respect to ground.
Unidirectional Concentric Stranding: A stranding where each successive layer has a different lay length, thereby retaining a circular form without migration of strands from one layer to another.
Unidirectional Stranding: A term denoting that in a stranded conductor all layers have the same direction of lay.
Unilay Strand: A conductor constructed with a central core surrounded by more than one layer of helically-laid wires, with all layers having a common length and direction of lay.
Velocity of Propagation (VP): The speed of an electrical signal down a length of cable compared to speed in free space expressed as a percent. It is the reciprocal of the square root of the dielectric constant of the cable insulation.
Volt: A unit of electromotive force.
Voltage: The term most often used in place of electromotive force, potential difference, or voltage drop to designate the electric pressure that exists between two points and is capable of producing a current when a closed circuit is connected between two points.
Voltage Drop: The voltage developed across a component or conductor by the current in the resistance or impedance of the component or conductor.
Voltage Rating: The highest voltage that may be continuously applied to a wire in conformance with standards or specifications.
Voltage Standing Wave Ratio (VSWR): The ratio of the maximum effective voltage to the minimum effective voltage measured along the length of a mis-matched radio frequency transmission line.
Volume Resistivity (Specific Insulation Resistance): The electrical resistance between opposite faces of a 1 cm. cube of insulating material, commonly expressed in Ω/centimeter.
Vulcanization: A chemical reaction in which the physical properties of an elastomer are changed by reacting it with sulfur or other cross-linking agents.
Wall Thickness: The thickness of the applied insulation or jacket.
Water Absorption: A test to determine the water absorbed by a material after a given immersion period.
Waterblocked Cable: A cable constructed with no internal voids in order to allow no longitudinal water passage under a given pressure.
Watt: A unit of electric power.
Wave Form: A graphical representation of a varying quantity. Usually, time is represented on the horizontal axis, and the current or voltage value is represented on the vertical axis.
Wave Length: The distance, measured in the direction of propagation, of a repetitive electrical pulse or waveform between two successive points that are characterized by the same phase of vibration.
Wicking: The longitudinal flow of a liquid in a wire or cable due to capillary action.
Wire: A conductor, either bare or insulated.
Wire and Cable Marker: Device for identification marking of wire and cable.
Wire and Cable Tying, Clamping, and Harnessing Devices: Tying tapes, lacing cords, and flexible sleevings which are used for wire and cable bundling, harnessing, and holding. Other devices include plastic ties or clamps, spiral-cut plastic tubing, and plastic U-shaped trays or ducts.
Wire and Lead Cutters: Tools for cutting range from plier type cutters to semiautomatic or fully automatic machines integrated with other wire processing operations such as stripping, forming, and terminating.
Wire Gauge: A system of numerical designation of wire sizes.
Wire Nut: A closed end splice that is screwed on instead of crimped.
Wire Wrapped Connection: A solderless connection made by wrapping bare wire around a square or rectangular terminal with a power or hand tool.
Wire Wrapping Tools: Portable electric tools and automatic stationary machines used to make solderless wrapped connections of wires to terminals.
Wiring Closet: See Telecommunications Closet.
Work Area (Work Station): A building space where the occupants interact with telecommunications terminal equipment.
Wrapper: An insulating barrier applied as a sheet or tape wrapped around a coil periphery.
Yield Strength: The minimum stress at which a material will start to physically deform without increase in load.
Zytel: DuPont's trade name for nylon resins.

Abbreviations & Acronyms

A-D: Analog to digital conversion
ac: Alternating current
AC: Armored Cable, NEC Article 333 Cable Designation
AC0: Analog Central Office
ACR: Attenuation to Crosstalk Ratio
ADO: Auxiliary Disconnect Outlet
AER: Aerial
AF: Audio frequency
AIA: American Institute of Architects
ALPETH: An aerial telephone cable having an aluminum shield and polyethylene jacket
ALS: A type of cable consisting of insulated conductors enclosed in a continuous, closely fitting aluminum tube
ALVYN: An indoor, riser rated telephone cable having an aluminum shield and vinyl jacket (PVC)
AM: Amplitude Modulation
ANSI: American National Standards Institute
ARPANET: Advanced Research Projects Agency Network
ASCII: American Standard Code for Information Interchange
ASME: American Society of Mechanical Engineers
ASP: A filled direct burial telephone cable used in areas subject to rodent attack. It consists of a filled cable core, corrugated aluminum shield, corrugated steel tape, flooding compound and polyethylene jacket.
ASTA: United Kingdom approval agency
ASTM: American Society for Testing and Materials
AWG: American Wire Gauge
AWM: Appliance wiring material
B & S Gauge: See American Wire Gauge (AWG)
B or BUR: Buried
AWM: Appliance wiring material
BCF: Billion Conductor Feet
BEF: Building Entrance Facility
BER: Bit Error Rate
BIC: Building Industry Consultant
BICSI: Building Industry Consulting Service International
BISDN: Broadband Integrated Services Digital Network
BTU: British Thermal Unit
CA: Cable
CATV: (1) Community Antenna Television; Cable Access Television (2) CATV Cable, NEC Article 820 Cable Designation
CATVP: CATV Plenum Cable, NEC Article 820 Cable Designation
CATVR: CATV Riser Cable, NEC Article 820 Cable Designation
CATVX: CATV Limited Use Cable, NEC Article 820 Cable Designation
CB: Citizens band
C-C: Conductor to conductor capacitance
CCITT: The International Telegraph and Telephone Consultative Committee
CCTV: Closed-circuit television
CDDI: Copper Distributed Data Interface
CDF: Central Distribution Frame
CDO: Community Dial Office
CEBEC: Belgium approval agency; Commite Electrotechnique Belge Service de la Marque
CEE: European standards agency; International Commission on Rules for the Approval of Electrical Equipment
CEN: European Committee for Standardization
CENELEC: European Committee for Electrotechnical Standardization
CFC: Communications Flat Cable
ckt: Circuit
CLT or CLOS: Closet
CL2: Class 2 Circuit Cable, NEC Article 725 Cable Designation
CL2P: Class 2 Circuit Plenum Cable, NEC Article 725 Cable Designation
CL2R: Class 2 Circuit Riser Cable, NEC Article 725 Cable Designation
CL2X: Class 2 Circuit Limited Use Cable, NEC Article 725 Cable Designation
CL3: Class 3 Circuit Cable, NEC Article 725 Cable Designation
CL3P: Class 3 Circuit Plenum Cable, NEC Article 725 Cable Designation
CL3R: Class 3 Circuit Riser Cable, NEC Article 725 Cable Designation
CL3X: Class 3 Circuit Limited Use Cable, NEC Article 725 Cable Designation
CM: Communications Cable, NEC Article 800 Cable Designation
CMA: Circular Mil Area
CMP: Communication Cable Plenum, NEC Article 800 Cable Designation
CMR: Communications Cable Riser, NEC Article 800 Cable Designation
CMX: Communications Limited Use Cable, NEC Article 800 Cable Designation
CO: Central Office
codec: Coder decoder
COE: Central Office Equipment
COS: Cooperation for Open Systems
COSINE: Cooperation for Open Systems Interconnection Network in Europe
COT: Central Office Terminal
CPC: Customer Premises Communication
CPE: (1) Chlorinated Polyethylene (2) Customer Premises Equipment or Customer Provided Equipment
CPU: Central Processing Unit
CRT: Cathode Ray Tube
CSMA/CD: Carrier Sense Multiple Access/ Collision Detection
CSPE: Chlorosulfonated Polyethylene
CTR: Certified Test Report
CV: Continuous vulcanization
D-A: Digital to analog conversion
DAF: Dedicated Access Facility
dB: Decibel
DBS: Direct Broadcast Satellite
dc: Direct current
DCE: Data Circuit-Terminating Equipment
DCO: Digital Central Office
DCR: Direct Current Resistance
DD: Distribution Designer or Distribution Device
DEMARC: Demarcation point
DEMKO: Approval agency of Denmark
DGM: Data Grade Medium
DISA: Defense Information Systems Agency (formerly DCA)
DISI: Directory Information Services Infrastructure
DIST: District
DRT: Plastic range and dryer cord (CSA)
DTE: Data Terminal Equipment
DVD: Digital Versatile Disc
DW: Distribution Wire
E: Symbol for voltage. Usually used to represent direct voltage or the effective (root-mean-square) value of an alternating voltage
EFTS: Electronic funds transfer system
EIA: Electronic Industries Association
EMF: Electromotive Force
EMI: Electromagnetic Interference
EMT: Electric Metallic Tubing
EP: Entrance point
EPDM: Ethylene-propylene-diene monomer rubber
EPOS: Electronic Point-Of-Sale
EPR: Ethylene-propylene rubber
ER: Equipment room
ESS: Electronic Switching System
ESTA: Australian approval agency; Electricity Trust of South Australia
ETPC: Electrolytic Tough Pitch Copper
ETV: Educational Television
E/W: Equipped With
EX or EXT: Extension
EXCH: Exchange
f: Frequency
FAA: Federal Aeronautics Administration
FCC: (1) Federal Communications Commission (2) Flat Conductor Cable, NEC Article 328 Cable Designation
FDDI: Fiber Distributed Data Interface
FDM: Frequency-Division Multiplexing
FDR: Feeder
FEP: Fluorinated ethylene propylene
FEXT: Far End Crosstalk
FI: Approval agency of Finland; Electrical Inspectorate
FIPS PUB: Federal Information Processing Standard Publication
FM: Frequency modulation
FOCIS: Fiber Optic Connector Intermateability Standard
FOTP: Fiber Optic Test Procedure
FOTS: Fiber Optics Transmission System
FPL: Power Limited Fire Protective Signaling Circuit Cable, NEC Article 760 Cable Designation
FPLP: Power Limited Fire Protective Signaling Circuit Plenum Cable, NEC Article 760 Cable Designation
FPLR: Power Limited Fire Protective Signaling Circuit Riser Cable, NEC Article 760 Cable Designation
FR-1: A flammability rating established by Underwriter's Laboratories for wires and cables that pass a specially designed vertical flame test
freq: Frequency
FRICC: Federal Research Internet Coordinating Committee (now FNC)
FRPE: Flame Retardant Polyethylene
ft: Foot
FTP: Fire Transfer Protocol
ga: Gauge
gHZ: Gigahertz
grd: Ground
GTO: Gas tube sign and oil-burner ignition cable. 5,000V-15,000V.
H: Designation for intensity of magnetic energy
hc: Handset combination (single line telephone)
HC: Horizontal cross-connect
hck: Handset combination; key (six button telephone)

Abbreviations & Acronyms

HDPE: High Density Polyethylene
HF: High Frequency
hh: Handhole
Hi-Pot: A test designed to determine the highest voltage that can be applied to a conductor without breaking through the insulation.
HPD: Rubber and asbestos-insulated heater cord. No braid on individual conductors but with braid overall. Also made with neoprene insulation and no asbestos or PVC/NBC.
HPN: Two-conductor, neoprene-insulated heater cord. Parallel construction. For use in damp locations.
HSJ: Same as type HS but with #18, #16 and #14 conductors and differing thickness of jacket.
HVAC: Heating, ventilation and air conditioning
Hz: Hertz
i: Symbol used to designate current
IC: Intermediate cross-connect
ICEA: Insulated Cable Engineers Association
IDC: Insulation Displacement Connector
IEC: Internation Electrotechnical Commission
IEEE: Institute of Electrical and Electronics Engineers
IGS: Integrated Gas Spacer Cable, NEC Article 325 Cable Designation
IMSA: International Municipal Signal Association
in: Inch
IRSG: Internet Research Steering Group
IRTF: Internet Research Task Force
IS: International Standard
ISA: Instrument Society of America
ISDN: Integrated Services Digital Network
ISO: International Organization for Standardization
ISOC: Internet Society
ITCO: Independent Telephone Company
ITU-T: International Telecommunications Union - Telecommunications Standardization Section
IW (C): Inside Wiring (cable)
J: Joule
KEMA KEUR: Approval agency of the Netherlands
kft: An abbreviation for 1000 ft.
kHz: Kilohertz
Kilo: A numerical prefix denoting 1000 (10^3)
km: Kilometer
KTS: Key Telephone Service
kV: Kilovolt
kVA: Kilovolt Ampere
kW: Kilowatt
LAN: Local Area Network
LASER: Light Amplification by Stimulated Emission of Radiation
LATA: Local Access Transport Area
lbf: Pound force
LBO: Line Buildout
LDPE: Low Density Polyethylene
LEC: Local Exchange Carrier
LED: Light-Emitting Diode
LLDPE: Linear Low Density Polyethylene
LOCA: Loss of Coolant Accident
locap: Low-capacitance, low-loss paired cable
MAC: Moves, Adds and Changes
MAP: Manufacturing Automation Protocol
MATV: Master Antenna Television
Mbps: Megabits per second
MC: (1) main cross-connect (2) Metal Clad Cable, NEC Article 334 Cable Designation
MCM: One thousand circular mils
MDF: Main Distribution Frame
MDPE: Medium Density Polyethylene
Meg or Mega: A numerical prefix denoting 1,000,000 (10^6)
M/G: Motor/Generator Set
MH: Manhole
Mho: The unit of conductivity. The reciprocal of an ohm.
MHz: Megahertz
MI: Mineral Insulated Cable, NEC Article 330 Cable Designation
Micro: A numerical prefix denoting one-millionth (10^6)
MIL STD: Military Standard
MILNET: Military Network
MLT: Multi-Level Threshold
mm: Millimeter
Modem: Modulator demodulator
MP: Multi-Purpose Cable, NEC Article 800 Cable Designation
MPOP: Minimum Point of Presence
MPP: Multi-Purpose Plenum Cable, NEC Article 800 Cable Designation
MPR: Multi-Purpose Riser Cable, NEC Article 800 Cable Designation
MTT: Main Telephone Terminal
MTW: Machine Tool Wire
MV: Medium Voltage Cable, NEC Article 326 Cable Designation
MW: Radio hookup wire with polyvinyl insulation and plain or nylon jacket or braid, or shield, 1000V
N: Newton
NAIC: Network Applications and Information Center
NASA: National Aeronautics and Space Administration
NBR: Natural butadiene-acrylonitrile copolymer rubber
NBS: National Bureau of Standards (now NIST)
NEC: National Electrical Code
NEMA: National Electrical Manufacturers Association
NEMKO: Approval agency of Norway
NESC: National Electrical Safety Code
NEXT: Near End Crosstalk
nf: Nanofarad
NFPA: National Fire Protection Association
NI: Network Interface
NID: Network Interface Device
NIST: National Institute of Standards and Technology (formerly NBS)
NIU: Network Interface Unit
nm: Nanometer
NM & NMC: Non Metallic Sheathed Cable, NEC Article 336 Cable Designation
NPLF: Non Power-Limited Fire Protective Signaling Circuit Cable, NEC Article 760 Cable Designation
NPLFP: Non Power-Limited Fire Protective Signaling Circuit Plenum Cable, NEC Article 760 Cable Designation
NPLFR: Non Power-Limited Fire Protective Signaling Circuit Plenum Cable, NEC Article 760 Cable Designation
NRZ: Non Return to Zero
NRZI: Non Return to Zero Inverted
OC: Optical Carrier
ODC: Ozone Depleting Chemical
OP: Outside Plant
OPE: Outside Plant Engineer
OSHA: Occupational Safety and Health Administration
OSI: Open Systems Interconnection
OVE: Approval agency of West Germany; Oesterreichischer Verband fur Elektrotechnik
PABX: Private Automatic Branch Exchange
PAM: Pulse Amplitude Modulation
PAP: A commonly used term for air core (unfilled) direct burial telephone cable with a corrugated aluminum shield
PBX: Private Branch Exchange
PC: Personal Computer
PCB: Printed Circuit Board
P-FEP: BICCGeneral proprietary dielectric material used injunction with FEP.
PCM: Pulse Code Modulation
PCP: A commonly used term for air core (unfilled) direct burial cable with a corrugated copper shield
PE: Polyethylene
pf: Picofarad
PFA: Polyfluoroalkoxy
PIC: A general term for any type of plastic insulated telephone cable
Pico: A numerical prefix denoting one-millionth of one-millionth (10^{-12})
PL: Private Lines
PLSJ: All-rubber, parallel-jacketed, two-conductor, light duty cord for pendant or portable use in damp locations. 300V.
PLT: (1) Plant (2) Same as PLSJ except thermo-plastic insulation
PLTC: Power Limited Tray Cable, NEC Article 725 Cable Designation
PM: Phase Modulation
POI: Point Of Interface
POSJ: All-rubber, parallel, light duty rip-cord for use on lamps and small appliances, 300V, 60°C
POT: Thermoplastic, parallel, light duty rip-cord. 300V, 60°C to 105°C.
POTS: Plain Old Telephone Service (colloquial)
PP: Polypropylene
PR: Pair
PTFE: Polytetrafluoroethylene
PTSS: Passive Transmission Sub-System
PVC: Polyvinyl Chloride
PVDF: Polyvinylidene Fluoride
R: Symbol for resistance
R-F: Radio-frequency
RCDD: Registered Communication Distribution Designer
REA: Rural Electrification Administration
REP: Repair
RFQ: Request for Quote
RG/U: General utility grade military coaxial cable
RH: Relative humidity
RJ-45: A specific pin-point assignment for an 8 position modular telecommunications connector.
RMS: (1) rack mount space (2) Root Mean Squares

Abbreviations & Acronyms

S: Heavy-duty, rubber-insulated portable cord. Stranded copper conductors with separator and individual rubber insulation. Two or more color coded conductors cabled with filler, wrapped with separator and rubber jacketed overall, 600 Volts.
SAE: Society of Automotive Engineers
SANZ: Standards Association of New Zealand
SBR: Styrene Butadiene Rubber
ScTP: Screened Twisted Pair
SDN: Switched Digital Network
SE: Service Entrance Cable, NEC Article 338 Cable Designation
SEMKO: Approval agency for Sweden
SFTP: Simple File Transfer Protocol
SI: System Internationale
SJ: Junior hard service, rubber-insulated pendant or portable cord. Same construction as type S, but 300V. Jacket thickness different.
SJO: Same as SJ, but carolprene, oil-resistant compound outer jacket. Can also be made "water-resistant." 300V, 60°C.
SJT: Junior hard service thermoplastic or rubber-insulated conductors with overall thermoplastic jacket, 300V, 60°C to 105°C.
SJTO: Same as SJT but oil-resistant thermoplastic outer jacket. 60°C.
SMTP: Simple Mail Transfer Protocol
SNA: Systems Network Architecture
SNM: Shielded Non Metallic Sheathed Cable, NEC Article 337 Cable Designation
SNMP: Simple Network Management Protocol
SNR: Signal to Noise Ratio
SO: Hard service cord, same construction as type S except oil-resistant carolprene jacket, 600V, 60° to 90°C.
SONET: Synchronous Optical Network
SP-1: All rubber, parallel-jacketed, two-conductor light duty cord for pendant or portable use in damp locations. 300V.
SP-2: Same as SP-1, but heavier construction, with or without third conductor for grounding purposes. 300V.
SP-3: Same as SP-23, but heavier construction for refrigerators or room air conditioners. 300V.
SPC: Stored Program Control
SPG: Single Point Ground
SPT-1: Same as SP-1, except all-thermoplastic. 300V. With or without third conductor for grounding.
SPT-2: Same as SP-2, except all-thermoplastic. 300V. With or without third conductor for grounding.
SPT-3: Same as SP-3, except all-thermoplastic. 300V. With or without third conductor for grounding.
SRD: Portable range or dryer cable. Three or four rubber-insulated conductors with rubber or neoprene jacket, flat or round construction. 300V, 60°C.
SRDT: Same as SRD, except all-thermoplastic with a maximum temperature of 90°C.
SRL: Structural return loss
ST: Hard service cord, jacketed, same as type S except all-plastic construction, 600V, 60°C to 105°C.
STA: Station
STO: Same as ST but with oil-resistant thermoplastic outer jacket. 600V, 60°C.
STP: Shielded twisted pair
SV: Vacuum cleaner cord, two or three-conductor, rubber-insulated. Overall rubber jacket. For light duty in damp locations. 300V, 60°C.
SVO: Same as SV except carolprene jacket, 300V, 60°C.
SVT: Same as SV except all-plastic construction. With or without third conductor for grounding purposes only. 300V, 60°C to 90°C.
SW: Station Wire
SWB: Switchboard
SWR: Standing Wave Ratio
SYS: System
TC: (1) Power and Control Tray Cable, NEC Article 340 Cable Designation (2) Telecommunications Closet
TCP: Transmission Control Protocol
TDM: Time-Division Multiplexing
TEL: Telephone
TELCO: Telephone Company
TERM: Terminal or termination
TEW: Canadian Standard Association type appliance wires. Solid or stranded single conductor, plastic-insulated, 600V, 105°C.
TF: Fixture wire, thermoplastic-covered solid or 7 strands. 60°C.
TFE: Tetrafluoroethylene
TFF: Same as TF but flexible stranding. 60°C.
THHN: 90°C, 600V nylon jacketed building wire
THW: Thermoplastic vinyl insulated building wire. Flame-retardant, moisture and heat-resistant. 75°C. Dry and wet locations.
THWN: Same as THW but with nylon jacket overall. 75°C.
TIA: Telecommunications Industry Association
TOC: Tin Overcoat
TP: Transport Protocol
TP-PMD: Twisted Pair-Physical Medium Dependent
TPDDI: Twisted Pair Distributed Data Interface
TSB: Telecommunications System Bulletin
TT: Telephone Terminal
TTB: Telephone Terminal Board
TTY: Text Telephones
TW: Thermoplastic vinyl-jacketed building wire, moisture-resistant. 60°C.
UCC: Uniform Code Council
UF: Thermoplastic underground feeder and branch circuit cable
UF: Underground Feeder and Branch Circuit Cable, NEC Article 339 Cable Designation
UG: Underground
UHF: Ultra High Frequency, 300 to 3,000 MHz
UL: Underwriter's Laboratories, Inc.
µm: Micron or micrometer
UPC: Universal Packaging Code
UPS: Uninterruptible Power Supply
USE: Underground Service Entrance Cable, NEC Article 338 Cable Designation
UTE: Approval agency for France; Union Technique de l'Electricite
UTP: Unshielded twisted-pair
V: Volt
VDE: West Germany approval agency
VHF: Very High Frequency, 30 to 300 MHz
VP: Velocity of Propagation
VSWR: Volume Standing Wave Radio
VW-1: A flammability rating established by Underwriters Laboratories for wires and cables that pass a specially designed vertical flame test, (formerly designated FR-1)
W: Symbol for watt or wattage
WA: Work area
WP: Waterproof Outlet
X: Cross-connect
XLPE: Crosslinked polyethylene
Z: Symbol for impedance

Hook-Up Wire Product Finder

TEMP.C	VOLTAGE	UL	UL	CSA	MIL	AWG	P/N	STRAND TYPE	PAGE
60	1500*	—	—	—	—	20	C1326	STRANDED	5
60	3000*	—	—	—	—	20	C1319	STRANDED	5
60	5000*	—	—	—	—	18	C1320	STRANDED	5
60	5000*	—	—	—	—	18	C1321	STRANDED	5
60	10000*	—	—	—	—	18	C1318	STRANDED	5
80	1000	—	—	—	W-76B	24	C7600	STRANDED	4
80	1000	—	—	—	W-76B	22	C7602	STRANDED	4
80	1000	—	—	—	W-76B	20	C7604	STRANDED	4
80	1000	—	—	—	W-76B	18	C7606	STRANDED	4
80	1000	—	—	—	W-76B	16	C7608	STRANDED	4
80	1000	—	—	—	W-76B	14	C7610	STRANDED	4
80	1000	—	—	—	W-76B	12	C7611	STRANDED	4
80/105	300	1007	1569	TR-64	—	24	C2003	SOLID	2
80/105	300	1007	1569	TR-64	—	24	C2015	STRANDED	2
80/105	300	1007	1569	TR-64	—	22	C2004	SOLID	2
80/105	300	1007	1569	TR-64	—	22	C2016	STRANDED	2
80/105	300	1007	1569	TR-64	—	20	C2028	SOLID	2
80/105	300	1007	1569	TR-64	—	20	C2040	STRANDED	2
80/105	300	1007	1569	TR-64	—	18	C2052	SOLID	2
80/105	300	1007	1569	TR-64	—	18	C2064	STRANDED	2
80/105	300	1007	1569	TR-64	—	16	C2053	SOLID	2
80/105	300	1007	1569	TR-64	—	16	C2065	STRANDED	2
105	600	1015	—	TEW	—	24	C2100	STRANDED	3
105	600	1015	—	TEW	—	22	C2101	STRANDED	3
105	600	1015	—	TEW	—	22	C2117	SOLID	3
105	600	1015	—	TEW	—	20	C2102	STRANDED	3
105	600	1015	—	TEW	—	20	C2118	SOLID	3
105	600	1015	—	TEW	—	18	C2103	STRANDED	3
105	600	1015	—	TEW	—	18	C2119	SOLID	3
105	600	1015	—	TEW	—	16	C2104	STRANDED	3
105	600	1015	—	TEW	—	14	C2105	STRANDED	3
105	600	1015	—	TEW	—	12	C2106	STRANDED	3
105	600	1015	—	TEW	—	10	C2107	STRANDED	3

* For Intermittent Duty Only

Multi-Conductor Cable Product Finder

NO. COND.	STRAND TYPE	AWG 28 P/N SHIELD PAGE	AWG 25 P/N SHIELD PAGE	AWG 24 P/N SHIELD PAGE	AWG 22 P/N SHIELD PAGE	AWG 20 P/N SHIELD PAGE	AWG 19 P/N SHIELD PAGE	AWG 18 P/N SHIELD PAGE	AWG 16 P/N SHIELD PAGE	AWG 14 P/N SHIELD PAGE	AWG 12 P/N SHIELD PAGE
1	SOLID										
	STRANDED		C1355 F 110			C1300 B,R 80		C1201 B . . . . . .81 C1301 B,R 80			
2	SOLID				C2515 F . . . . . .15 C2676 B . . . . . .20 C4008 U . . . . .7,28 C4408 U . . . . . .122 E1000S U . . . . . .94 E1002S . . . . . .94 E1482S U . . . . . .83 E2000S F . . . . . .95 E2100S F-P . . . .97 E2482S S . . . . . .84 E3000S U-P . . . .96 E3482S U-P . . . .85 E3542S F-P 86	C2509 F . . . . . .116 C4311 U 7	C2754 U 7	C0471 U . . . . . .89 C0472 F . . . . . .90 C3060 F-P . . . .101 C3110 U-P . . . . .99 C3167 F-P . . . . .92 C3200 U-P . . . . .87 C3240 U-P . . . . .91 C3260 F-P . . . . .88 E1030S U . . . . . .94 E1502S U . . . . . .83 E2030S F . . . . . .95 E2200S . . . . . .97 E2200S F-P . . . .97 E2402S U . . . . . .83 E2502S F . . . . . .84 E3030S U-P . . . .96 E3502S U-P . . . .85 E3602S F-P 86	C0473 U . . . . . .89 C0474 F . . . . . .90 C3168 F-P . . . . .92 C3210 U-P . . . . .87 C3241 U-P . . . . .91 C3270 F-P . . . . .88 E1512S U . . . . . .83 E2404S U . . . . . .83 E2522S F . . . . . .84 E3512S U-P . . . .85 E3612S F-P 86	C0475 U . . . . . .90 C0491 U . . . . . .89 C3172 F-P . . . . .92 C3220 U-P . . . . .87 C3224 U-P . . . . .87 C3244 U-P . . . . .91 C3280 F-P . . . . .88 E1522S U . . . . . .83 E2406S U . . . . . .83 E2532S F . . . . . .84 E3522S U-P . . . .85 E3622S F-P 86	C0476 F . . . . . .90 C0492 U . . . . . .89 C3174 F-P . . . . .92 C3224 U-P . . . . .87 C3246 U-P . . . . .91 C3282 F-P . . . . .88 E1532S U . . . . . .83 E2542S F . . . . . .84 E3532S U-P . . . .85 E3632S F-P 86
	STRANDED	C6500 B 22	C1375 ISB . . . . .110 C1376 ISB 110	C0740 F . . . . . .37 C1226 S . . . . . .77 C1228 F . . . . . .78 C1356 U . . . . . .124 C2461 U . . . . . .8 C2513 F 15	C0431 U . . . . . .13 C0450 F . . . . . .18 C0760 F . . . . . .38 C1322 B . . . . . .79 C1362 U . . . . . .124 C2514 F . . . . . .15 C2516 F . . . . . .15 C2518 F . . . . . .17 C2520 F . . . . . .17 C2677 B . . . . . .20 C2679 B . . . . . .21 C2882 S . . . . . .19 C3105 U-P . . . .100 C3115 U-P . . . . .99 C3154 F-P . . . .102 C3158 F-P . . . .101 C6310 UJ . . . . .121 C6348 U . . . . . .9 E2002S F . . . . . .95 E2102S F-P . . . .97 E3002S U-P 96	C0433 U . . . . . .13 C0452 F . . . . . .18 C0780 F . . . . . .38 C1302 B,R . . .25,80 C1360 U . . . . . .124 C1642 B . . . . . .23 C2519 F . . . . . .17 C2524 F . . . . . .15 C2540 F . . . . . .15 C2681 B . . . . . .21 C2888 S . . . . . .19 C3320 F-P . . . .102 C3602 U-R . . . . .14 C6311 UJ . . . . .121 C6351 U . . . . . .10 C6365 U . . . . . .125 E1022S U . . . . . .94 E2022S F . . . . . .95 E2122S F-P . . . .97 E3022S U-P 96		C0435 U . . . . . .13 C0454 F . . . . . .18 C1202 B,C . . .26,81 C1357 U . . . . . .124 C2521 F . . . . . .17 C2534 F . . . . . .15 C2551 F . . . . . .118 C2686 B . . . . . .21 C2830 U . . . . . .10 C2892 S . . . . . .19 C3062 F-P . . . .101 C3102 U-P . . . .100 C3112 U-P . . . . .99 C3162 F-P . . . .102 C5460 U . . . . . .120 C6312 UJ . . . . .121 C6367 U . . . . . .125 E1032S U . . . . . .94 E2032S F . . . . . .95 E2202S F-P . . . .97 E3032S U-P 96	C0437 U . . . . . .13 C0456 F . . . . . .18 C1358 U . . . . . .124 C1602 B,C . . .26,81 C2405 U . . . . . .11 C2536 F . . . . . .15 C2553 F . . . . . .118 C2895 S . . . . . .19 C3068 F-P . . . .101 C3127 U-P . . . . .99 C3169 F-P . . . .102 C3193 U-P . . . .100 E1042S U . . . . . .94 E2042S F . . . . . .95 E2242S F-P . . . .97 E3042S U-P 96	C0439 U . . . . . .13 C0458 F . . . . . .18 C1361 U . . . . . .124 C1612 B,C . . . . .26 C2409 U . . . . . .11 C2538 F . . . . . .15 C2550 F . . . . . .118 C3126 U-P . . . .100 C3128 U . . . . . .99 E1052S U . . . . . .94 E2052S F . . . . . .95 E2252S F-P . . . .97 E3052S U-P 96	C0441 U . . . . . .13 C0460 F . . . . . .18 C1363 U . . . . . .124 C1364 U . . . . . .125 C2410 U . . . . . .11 C2539 F . . . . . .15 C2552 F . . . . . .118 C3129 U . . . . . .99 E1062S U . . . . . .94 E2062S F . . . . . .95 E2262S F-P . . . .97 E3062S U-P 96
3	SOLID				C4310 U . . . . . .7 C4410 U 122	C2510 F 116	C2755 U 7	C3114 U-P . . . . .99 E1503S U . . . . . .83 E2503S S . . . . . .84 E3503S U-P . . . .85 E3603S F-P 86			
	STRANDED	C0530 FB . . . . . .41 C0939 FB . . . . . .39 C6501 B 22		C0680 FB . . . . . .41 C0741 F . . . . . .37 C0951 FB . . . . . .39 C2462 U 8	C0432 U . . . . . .13 C0451 F . . . . . .18 C0761 F . . . . . .38 C0971 FB . . . . . .40 C1335 S . . . . . .19 C2517 F . . . . . .15 C2526 F . . . . . .15 C2678 B . . . . . .21 C3310 F-P . . . .102 C4062 U . . . . . .9 E1003S U . . . . . .94 E2003S F . . . . . .95 E2103S F-P . . . .97 E3003S U-P 96	C0434 U . . . . . .13 C0453 F . . . . . .18 C0781 F . . . . . .38 C1304 B,R . . . . .25 C1332 B . . . . . .21 C1333 F . . . . . .112 C1643 B . . . . . .23 C2525 F . . . . . .15 C2528 F . . . . . .15 C3321 F-P . . . .102 C3603 U,R . . . . .14 C6061 IF . . . . . .117 C6352 U . . . . . .10 E1023S U . . . . . .94 E2023S F . . . . . .95 E2123S F-P . . . .97 E3023S U-P 96		C0436 U . . . . . .13 C0455 F . . . . . .18 C1203 B,C . . . . .26 C2535 F . . . . . .15 C2687 B . . . . . .21 C2768 S . . . . . .19 C2831 U . . . . . .10 C3064 F-P . . . .101 C3120 U-P . . . . .99 C3164 F-P . . . .102 C3190 U-P . . . .100 E1033S U . . . . . .94 E2033S F . . . . . .95 E2203S F-P . . . .97 E3033S U-P 96	C0438 U . . . . . .13 C0457 F . . . . . .18 C1603 B,C . . . . .26 C2406 U . . . . . .11 C2537 F . . . . . .15 C3194 U-P . . . .100 C3340 F-P . . . .102 E1043S U . . . . . .94 E2043S F . . . . . .95 E2243S F-P . . . .97 E3043S U-P 96	C0440 U . . . . . .13 C0459 F 18	
4	SOLID				C4412 U . . . . . .122 E1001S S . . . . . .94 E1484S U . . . . . .83 E2484S S . . . . . .84 E3001S U-P 96			C0485 U . . . . . .89 C0494 F . . . . . .90 C3061 F-P . . . .101 C3111 U-P . . . . .99 C3170 F-P . . . . .92 C3201 U-P . . . . .87 C3242 U-P . . . . .91 C3261 F-P . . . . .88 E1504S U . . . . . .83 E2504S S . . . . . .84 E3504S U-P . . . .85 E3604S F-P 86	C0486 U . . . . . .89 C3171 F-P . . . . .92 C3211 U-P . . . . .87 C3243 U-P . . . . .91 C3271 F-P . . . . .88 E1514S U . . . . . .83 E2524S F . . . . . .84 E3514S U-P . . . .85 E3614S F-P 86	C0496 F . . . . . .90 C3173 F-P . . . . .92 C3223 U-P . . . . .87 C3245 U-P . . . . .91 C3284 F-P . . . . .88 E1524S U . . . . . .83 E2534S F . . . . . .84 E3524S U-P . . . .85 E3624S F-P 86	C0497 F . . . . . .90 C3175 F-P . . . . .92 C3225 U-P . . . . .87 C3247 U-P . . . . .91 C3283 F-P . . . . .88 E1534S U . . . . . .83 E2544S F . . . . . .84 E3534S U-P . . . .85 E3634S F-P 86
	STRANDED	C0531 FB . . . . . .41 C0940 FB . . . . . .39 C6502 B 22	C1330 F 111	C0681 FB . . . . . .41 C0742 F . . . . . .37 C0952 FB . . . . . .39 C2463 U 8	C0762 F . . . . . .38 C0972 FB . . . . . .40 C1118 . . . . . .120 C1337 S . . . . . .19 C1340 F . . . . . .113 C2523 F . . . . . .15 C2680 B . . . . . .21 C3106 U-P . . . .100 C3116 U-P . . . . .99 C3155 F-P . . . .102 C3159 F-P . . . .101 C4063 U . . . . . .9 C5076 U . . . . . .120 E1004S U . . . . . .94 E2004S F . . . . . .95 E2104S F-P . . . .97 E3004S U-P 96	C0782 F . . . . . .38 C1119 U . . . . . .120 C1305 B,R . . . . .25 C1331 F . . . . . .113 C1343 F . . . . . .113 C1644 B . . . . . .23 C2555 F . . . . . .15 C2683 B . . . . . .21 C3322 F-P . . . .102 C3604 U,R . . . . .14 C5078 U . . . . . .120 C6353 U . . . . . .10 E1024S U . . . . . .94 E2024S F . . . . . .95 E2124S F-P . . . .97 E3024S U-P 96		C0444 U . . . . . .13 C1123 U . . . . . .120 C1204 B,C . . . . .26 C2404 U . . . . . .10 C2543 F . . . . . .16 C2688 B . . . . . .21 C3063 F-P . . . .101 C3103 U-P . . . .100 C3113 U . . . . . .99 C3163 F-P . . . .102 C5084 U . . . . . .120 E1034S U . . . . . .94 E2034S F . . . . . .95 E2204S F-P . . . .97 E3034S U-P 96	C1604 B,C . . . . .26 C2425 U . . . . . .11 C3195 U-P . . . .100 C3341 F-P . . . .102 E1044S U . . . . . .94 E2044S F . . . . . .95 E2244S F-P . . . .97 E3044S U-P 96	C1614 B,C . . . . .26 C2430 U . . . . . .11 E1054S U . . . . . .94 E2054S F . . . . . .95 E2254S F-P . . . .97 E3054S U-P 96	C2440 U . . . . . .11 E1064S U . . . . . .94 E2064S F . . . . . .95 E2264S F-P . . . .97 E3064S U-P 96

B - BRAID SHIELD
C - CAROLPRENE®
F - FLEXFOIL® SHIELD
FB - FLEXFOIL® /BRAID SHIELD
I - INDIVIDUAL FLEXFOIL® SHIELD
IFB - INDIVIDUAL FLEXFOIL® + FLEXFOIL® /BRAID
P - PLENUM
R - RUBBER
S - SPIRAL SHIELD
U - NO SHIELD
UJ - UN-JACKETED

Multi-Conductor Cable Product Finder

NO. COND.	STRAND TYPE	AWG 28 P/N SHIELD PAGE	AWG 25 P/N SHIELD PAGE	AWG 24 P/N SHIELD PAGE	AWG 22 P/N SHIELD PAGE	AWG 20 P/N SHIELD PAGE	AWG 19 P/N SHIELD PAGE	AWG 18 P/N SHIELD PAGE	AWG 16 P/N SHIELD PAGE	AWG 14 P/N SHIELD PAGE	AWG 12 P/N SHIELD PAGE
5	SOLID							C3117 U-P 99			
	STRANDED	C0532 FB .....41 C0941 FB 39		C0682 FB .....41 C0753 F .....37 C0953 FB .....39 C2464 U 8	C0973 FB .....40 C1124 U .....120 C4064 U .....9 C5086 U 120	C1126 U .....120 C1308 B,R .....25 C1645 B .....23 C3605 U,R .....14 C6355 U 10		C2420 U 10	C2434 U 11	C2437 U 11	
6	SOLID							C3118 U-P .....99 E1506S U .....83 E2506S S .....84 E3506S U-P .....85 E3606S F-P 86			
	STRANDED	C0533 FB .....41 C0942 FB .....39 C6503 B 22		C0683 FB .....41 C0743 F .....37 C0954 FB .....39 C1345 F .....112 C2466 U 8	C0763 F .....38 C0974 FB .....40 C1341 S .....19 C3311 F-P .....102 C4066 U .....9 E1006S U .....94 E2006S F .....95 E2106S F-P .....97 E3006S U 96	C0783 F .....38 C1310 B,R .....25 C1646 B .....23 C3606 U,R .....14 C6062 IF 117		C1206 B,C .....26 C3065 F-P .....101 C3121 U-P .....99 C3166 F-P .....102 C3192 U-P .....100 E1036S U .....94 E2036S F .....95 E2206S F-P .....97 E3036S U-P 96	C1606 B,C 26		
7	SOLID										
	STRANDED	C0534 FB .....41 C0943 FB 39		C0684 FB .....41 C0754 F .....37 C0955 FB .....39 C2488 U 8	C0975 FB .....40 C4088 U 9	C1312 B,R .....25 C3607 U,R .....14 C6356 U 10		C2421 U 10	C2426 U 11	C2431 U 11	
8	SOLID							C3119 U-P .....99 E1508S U .....83 E2508S S 84			
	STRANDED	C0535 FB .....41 C0944 FB .....39 C6504 B 22		C0685 FB .....41 C0744 F .....37 C0956 FB .....39 C2465 U 8	C0764 F .....38 C0976 FB .....40 C1130 U .....120 C4065 U .....9 C4080 U .....120 C5096 U .....120 E1008S U .....94 E2008S F .....95 E2108S F-P .....97 E3008S U-P 96	C0784 F .....38 C1313 B,R .....25 C1648 FB .....24 C3608 U,R 14 C4090 120		C1208 B,C .....26 C3122 U-P .....99 C3180 F-P .....102 C3191 U-P .....100 E1038S U .....94 E2038S F .....95 E2208S F-P .....97 E3038S U-P 96	C1608 B,C .....26 C2443 U 11		
9	SOLID							C2422 U 10			
	STRANDED	C0536 FB .....41 C0945 FB 39		C0686 FB .....41 C0755 F .....37 C0957 FB .....39 C2470 U 8	C0977 FB .....40 C4070 U 9	C6357 U 10			C2435 U 11		
10	SOLID					C2511 F 116					
	STRANDED	C0537 FB .....41 C0946 FB .....39 C6505 B 22		C0687 FB .....41 C0745 F .....37 C0958 FB .....39 C2471 U 8	C0765 F .....38 C0978 FB .....40 C4071 U .....9 E1010S U .....94 E20101S F 95	C0785 F .....38 C3610 U,R 14		C1210 B,C .....26 C3178 U-P .....100 C3181 F-P .....102 E1040S U .....94 E2040S F 95			
12	SOLID										
	STRANDED	C6506 B 22		C2467 U 8	C4067 U .....9 E1012S U .....94 E2012S F 95	C6360 U 10		C1212 B,C .....26 C2412 U .....10 C3179 U-P .....100 C3182 F-P .....102 E1041S U .....94 E2041S F 95	C2427 U 11		
15	SOLID					C6358 U 10		C2423 U 10	C2428 U 11		
	STRANDED	C0538 FB .....41 C0947 FB .....39 C6507 B 22		C0688 FB .....41 C0746 F .....37 C0959 FB .....39 C2473 U 8	C0766 F .....38 C0979 FB .....40 C4073 U 9	C0786 F 38					
18	SOLID										
	STRANDED				C4069 U 9						
19	SOLID										
	STRANDED							C2424 U 10	C2429 U 11		
20	SOLID										
	STRANDED	C6508 B 22		C0747 F .....37 C0960 FB .....39 C2475 U 8	C0767 F .....38 C0980 FB .....40 C4075 U 9	C0787 F 38					
25	SOLID										
	STRANDED	C0539 FB .....41 C0948 FB 39		C0748 F .....37 C0961 FB .....39 C2476 U 8	C0768 F .....38 C0981 FB .....40 C4076 U 9			C2433 U 10	C2436 U 11		
30	SOLID										
	STRANDED			C0749 F 37	C4077 U 9						
40	SOLID										
	STRANDED			C0750 F 37	C4078 U 9						
50	SOLID										
	STRANDED			C0751 F 37	C4079 U 9						

B - BRAID SHIELD
C - CAROLPRENE®
F - FLEXFOIL® SHIELD
FB - FLEXFOIL® /BRAID SHIELD
I - INDIVIDUAL FLEXFOIL® SHIELD
IFB - INDIVIDUAL FLEXFOIL® + FLEXFOIL® /BRAID
P - PLENUM
R - RUBBER
S - SPIRAL SHIELD
U - NO SHIELD
UJ - UN-JACKETED

Multi-Paired Cable Product Finder

NO. PAIRS	STRAND TYPE	AWG 28 P/N	SHIELD	PAGE	AWG 24 P/N	SHIELD	PAGE	AWG 22 P/N	SHIELD	PAGE	AWG 20 P/N	SHIELD	PAGE	AWG 18 P/N	SHIELD	PAGE
1	SOLID							C4008 U		7,28						
	STRANDED				C0600 F		42	C3204 F-P		103				C6101 U		29
					C0841 FB		48	C0720 F		43						
					C4841 FB		48									
2	SOLID				2133009 U		123	C1670 F		30						
					2133198 U		123	C4010 U		28						
					7036478 U		123	C8004 FB		50						
								C8006 FB		50						
	STRANDED	C0500 FB		52	C0515 FB		53	C0550 F		32				C0560 F		32
		C0804 FB		49	C0601 F		42	C0570 IF		35				C0584 IF		35
					C0620 FB		46	C0650 FB		47				C3362 F-P		104
					C0829 FB		51	C0721 F		43				C6118 U		29
					C0842 FB		48	C1338 B		114						
					C0890 F		44	C1350 IF		33						
					C0910 IF		57	C1352 IF		34						
					C0924 IFB		58	C1353 IF		34						
					C3028 F-P		106	C3156 IF-P		107						
					C3150 F-P		103	C3205 F-P		103						
					C3214 F-P		105	C3352 F-P		104						
					C4842 FB		48	C6010 U		28						
3	SOLID				2133013 U		123	C4014 U		28						
					7036452 U		123	C6035 IF		55						
	STRANDED	C0501 FB		52	C0516 FB		53	C0551 F		32	C6052 IF		54	C0561 F		32
		C0805 FB		49	C0602 F		42	C0571 IF		35				C0585 IF		35
					C0615 F		45	C0651 FB		47				C6047 IF		54
					C0621 FB		46	C0722 F		43				C6103 U		29
					C0830 FB		51	C3157 IF-P		107						
					C0843FB		48	C3206 F-P		103						
					C0901 F		44	C3353 F-P		104						
					C0911 IF		57	C6014 U		28						
					C0925 IFB		58	C6040 IF		54						
					C3029 F-P		106									
					C3153 F-P		103									
					C3215 F-P		105									
					C4843 FB		48									
					C6065 IF		54									
4	SOLID				2133017 U		123	C1676 F		30						
					2133200 U		123	C4015 U		28						
					7042187 U		123									
	STRANDED	C0502 FB		52	C0517 FB		53	C0552 F		32	C1368 IF		56	C0562 F		32
		C0806 FB		49	C0603 F		42	C0572 IF		35				C0586 IF		35
					C0616 F		45	C0652 FB		47				C3364 F-P		104
					C0622 FB		46	C0723 F		43				C6119 U		29
					C0831 FB		51	C3207 F-P		103						
					C0844 FB		48	C3354 F-P		104						
					C0893 F		44	C06015 U		28						
					C0912 IF		57									
					C0926 IFB		58									
					C3030 F-P		106									
					C3151 F-P		103									
					C3216 F-P		105									
					C4844 FB		48									
4.5	SOLID															
	STRANDED				C3217 F-P		105									
5	SOLID													C6120 U		29
	STRANDED	C0503 FB		52	C0518 FB		53	C0653 FB		47						
		C0807 FB		49	C0604 F		42	C0724 F		43						
					C0623 FB		46									
					C0832 FB		51									
6	SOLID							C1671 F		30						
								C6036 IF		55						
	STRANDED	C0504 FB		52	C0519 FB		53	C0553 F		32	C6053 IF		54	C0563 F		32
					C0605 F		42	C0573 IF		35				C0587 IF		35
					C0617 F		45	C0654 FB		47				C6048 IF		54
					C0624 FB		46	C0725 F		43				C6106 U		29
					C0839 FB		51	C3208 F-P		103						
					C0899 F		44	C3356 F-P		104						
					C0913 IF		57	C6017 U		28						
					C3031 F-P		106	C6041 IF		54						
					C3165 F-P		103									
					C3218 F-P		105									
					C6066 IF		54									

B - BRAID SHIELD
C - CAROLPRENE®
F - FLEXFOIL® SHIELD
FB - FLEXFOIL® /BRAID SHIELD
I - INDIVIDUAL FLEXFOIL® SHIELD
IFB - INDIVIDUAL FLEXFOIL® + FLEXFOIL® /BRAID
P - PLENUM
R - RUBBER
S - SPIRAL SHIELD
U - NO SHIELD
UJ - UN-JACKETED

Multi-Paired Cable Product Finder

NO. PAIRS	STRAND TYPE	AWG 28 P/N	AWG 28 SHIELD	AWG 28 PAGE	AWG 24 P/N	AWG 24 SHIELD	AWG 24 PAGE	AWG 22 P/N	AWG 22 SHIELD	AWG 22 PAGE	AWG 20 P/N	AWG 20 SHIELD	AWG 20 PAGE	AWG 18 P/N	AWG 18 SHIELD	AWG 18 PAGE
7	SOLID															
	STRANDED	C0505 FB C0808 FB		52 49	C0520 FB C0606 F C0625 FB C0833 FB		53 42 46 51	C0655 FB		47						
8	SOLID															
	STRANDED	C0506 FB		52	C0521 FB C0607 F C0626 FB		53 42 46	C0656 FB		47				C6121 U		29
9	SOLID							C1672 F		30						
	STRANDED				C0608 F C0618 F C0914 IF C6067 IF		42 45 57 54	C0554 F C0574 IF C0726 F C6042		32 35 43 54	C6054 IF		54	C6109 U C0564 F C0588 IF C6049 IF		29 32 35 54
10	SOLID															
	STRANDED	C0507 FB C0810 FB		52 49	C0522 FB C0609 F C0628 FB C0835 FB		53 42 46 51	C0658 FB		47						
11	SOLID															
	STRANDED				C0915 IF		57	C6043 IF		54						
12	SOLID															
	STRANDED	C0812 FB		49	C0836 FB C0916 IF		51 57	C6059 IF		54	C6056 IF		54	C6050 IF		54
12.5	SOLID															
	STRANDED	C0508 FB		52	C0523 FB C0619 F C0630 FB C0897 F C3152 F-P		53 45 46 44 103	C0660 FB		47						
15	SOLID							C1673 F		30						
	STRANDED	C0509 FB		52	C0524 FB C0610 F C0917 IF		53 42 57	C0728 F C6044 IF		43 54	C6058 IF		54	C6051 IF		54
17	SOLID															
	STRANDED							C6060 IF		54						
18	SOLID															
	STRANDED	C0510 FB		52	C0525 FB		53									
19	SOLID															
	STRANDED				C0611 F		42	C6045 IF		54						
25	SOLID															
	STRANDED	C0511 FB		52	C0526 FB C0612 F		53 42									
27	SOLID															
	STRANDED							C6046 IF		54						
51	SOLID							C6451 F		31						
	STRANDED															

B - BRAID SHIELD
C - CAROLPRENE®
F - FLEXFOIL® SHIELD
FB - FLEXFOIL® /BRAID SHIELD
I - INDIVIDUAL FLEXFOIL® SHIELD
IFB - INDIVIDUAL FLEXFOIL® + FLEXFOIL® /BRAID
P - PLENUM
R - RUBBER
S - SPIRAL SHIELD
U - NO SHIELD
UJ - UN-JACKETED

Coaxial Cable Product Finder

	RG 6 TYPE	RG 7 TYPE	RG 8 TYPE	RG 11 TYPE	RG 58 TYPE	RG 59 TYPE	RG 62 TYPE	RG 174 TYPE	RG 213 TYPE	THINNET
AERIAL	C5802. 61			C5041. 66		C5842. 71				
AMATEUR RADIO			C1108. . . . . 64 C1154. . . . . 64 C1198. 64		C1188. 67	C1102. . . . . 68 C1106. 68				
ANALOG VIDEO	C5777. 61			C5029. 66		C5816. . . . . 69 C5838. 74				
BROADCAST	C5820. . . . . 62 C5822. 62		C1108. . . . . 64 C1154. . . . . 64 C1180. . . . . 64 C1198. 64		C1117. . . . . 67 C1155. . . . . 67 C1166. . . . . 67 C1178. . . . . 67 C1188. . . . . 67 C5045. . . . . 67 C3519. . 67,108			C1156. 73	C1176. 73	
CAMERA	C5761. 60			C5011. 65		C1102. . . . . 68 C1103. . 68,115 C1135. . . . . 68 C1142. 68				
CATV DROP	C3521. . 62,108 C5760. . . . . 60 C5774. . . . . 60 C5775. . . . . 60 C5776. . . . . 60 C5777. . . . . 61 C5785. . . . . 60 C5810. . . . . 61 C5812. . . . . 61 C5814. . . . . 61 C5820. . . . . 62 C5822. 62	C5851. . . . . 63 C5856. . . . . 63 C5857. 63		C5029. . . . . 66 C5034. . . . . 65 C5039. . . . . 65 C5044. 65		C1102. . . . . 68 C1106. . . . . 68 C1112. . . . . 69 C5770. . . . . 70 C5780. . . . . 70 C5782. . . . . 70 C5784. . . . . 70 C5832. . . . . 70 C5834. . . . . 69 C5830. 70				
CCTV (Closed Circuit Television)	C5761. 60			C5011. 65		C1103. . 68,115 C1135. . . . . 68 C1142. . . . . 68 C8025. . . . 115 C8027. . . . 115				
CITIZEN BAND RADIO			C1108. . . . . 64 C1154. . . . . 64 C1180. . . . . 64 C1198. 64		C1188. 67	C1102. . . . . 68 C1104. . . . . 68 C1106. . . . . 68 C1110. . . . . 69 C5836. 69				
COMPUTER	C5760. . . . . 60 C5785. 60					C1102. . . . . 68 C1103. . 68,115 C1112. . . . . 69 C1135. 68	C1162. . . . . 72 C1164. . . . . 72 C3520. . 72,108			C5779. 74
DIGITAL VIDEO	C5814. 61					C5816. . . . . 69 C5838. 74				

Coaxial Cable Product Finder

	RG 6 TYPE	RG 7 TYPE	RG 8 TYPE	RG 11 TYPE	RG 58 TYPE	RG 59 TYPE	RG 62 TYPE	RG 174 TYPE	RG 213 TYPE	THINNET
DIRECT BURIAL	C5804. 61	C5853. 63		C5043. 66		C5844. 71				
DIRECT BROADCAST SATELLITE (DBS)	C5820. . . . . 62 C5822. . . . . 62 C5824. . . . . 62 C5826. 62									
HEAD END	C5785. 60									
INSTRUMENTATION	C3521. . 62,108 C3523. . 62,108		C1108. 64		C1166. . . . . 67 C5045. 67		C3520. . 72,108	C1156. . . . . 73 C1158. 71		
LAN (Local Area Network) Thinnet	C5775. . . . . 60 C5785. . . . . 60 C5812. 61		C1198. 64			C1103. . 68,115 C1104. . . . . 68 C1110. . . . . 69 C1112. . . . . 69 C5770. . . . . 70 C5836. 69				C3579. . 74,108 C5779. 74
MATV	C3521. . 62,108 C3523. . 62,108 C5760. . . . . 60 C5774. . . . . 60 C5775. . . . . 60 C5776. . . . . 60 C5777. . . . . 61 C5785. . . . . 60 C5810. . . . . 61 C5812. . . . . 61 C5814. . . . . 61 C5820. . . . . 62 C5822. 62	C5851. . . . . 63 C5856. . . . . 63 C5857. 63		C1160. . . . . 65 C5025. . . . . 65 C5029. . . . . 66 C5034. . . . . 65 C5039. . . . . 65 C5044. 65		C1103. . 68,115 C1104. . . . . 68 C1110. . . . . 69 C1135. . . . . 68 C5770. . . . . 70 C5780. . . . . 70 C5782. . . . . 70 C5784. . . . . 70 C5836. 69		C1158. 71		
MONITOR/VDT DISPLAY						C1102. . . . . 68 C1103. . 68,115 C1104. . . . . 68 C1110. . . . . 69 C5770. . . . . 70 C5836. . . . . 69 C8005. 69				
PLENUM	C3521. . 62,108 C3523. . 62,108				C3519. . 67,108	C3500. . 71,108	C3520. . 72,108			C3579. . 74,108
PRECISION VIDEO	C5814. 61					C5816. . . . . 69 C5838. 74				
RF TRANSMISSION	C5774. . . . . 60 C5775. . . . . 60 C5776. . . . . 60 C5777. . . . . 61 C5785. 60	C5851. . . . . 63 C5856. . . . . 63 C5857. 63	C1154. . . . . 64 C1180. 64	C1160. . . . . 65 C5025. . . . . 65 C5029. 66	C1117. . . . . 67 C1155. . . . . 67 C1166. . . . . 67 C1178. . . . . 67 C1188. . . . . 67 C3519. . 67,108 C5045. 67	C1104. . . . . 68 C1112. . . . . 69 C1110. . . . . 69 C5770. . . . . 70 C5836. 69	C1162. . . . . 72 C1164. . . . . 72 C3520. . 72,108	C1156. . . . . 73 C1158. 71	C1176. 73	C3579. . 74,108 C5779. 74

Belden-to-BICCGeneral Carol® Brand Cross Reference Index

BELDEN PART NO.	BICCG/CAROL PART NO.	BELDEN PART NO.	BICCG/CAROL PART NO.	BELDEN PART NO.	BICCG/CAROL PART NO.	BELDEN PART NO.	BICCG/CAROL PART NO.
8104	**C0517**	8421	**C1389**	8720	**C2538**	9159	**C6120**
8105	**C0518**	8422	**C1322**	8722	**C1331**	9160	**C4019**
8106	**C0519**	8423	**C1304**	8723	**C1352**	9161	**C6121**
8107	**C0520**	8424	**C1305**	8724	**C1340**	9182	**C8014**
8108	**C0521**	8425	**C1308**	8725	**C1368**	9184	**C1354**
8110	**C0522**	8426	**C1310**	8728	**C1353**	9192	**C5032**
8112	**C0523**	8427	**C1312**	8730	**C1344**	9201	**C1117**
8125	**C0526**	8428	**C1202**	8732	**C1338**	9207	**C8000**
8132	**C0500**	8434	**C1330**	8734	**C1334**	9209	**C1194**
8133	**C0501**	8437	**C2676**	8735	**C2678**	9211	**C1225**
8134	**C0502**	8441	**C2677**	8737	**C2882**	9222	**C1150**
8135	**C0503**	8442	**C6348**	8740	**C4008**	9223	**C1151**
8138	**C0506**	8443	**C4062**	8741	**C4010**	9224	**C1100**
8162	**C0924**	8444	**C4063**	8742	**C4014**	9231	**C1190**
8163	**C0925**	8445	**C4064**	8743	**C4017**	9239	**C1157**
8164	**C0926**	8446	**C4081**	8747	**C6017**	9243	**C5782**
8205	**C6351**	8447	**C4082**	8748	**C6019**	9244	**C5836**
8212	**C1102**	8448	**C4083**	8749	**C6026**	9251	**C1152**
8213	**C5025**	8449	**C4084**	8750	**C6030**	9258	**C1108**
8214	**C1198**	8450	**C2515**	8751	**C6451**	9259	**C1103**
8215	**C5810**	8451	**C2516**	8757	**C4015**	9265	**C8025**
8216	**C1156**	8456	**C4071**	8759	**C2888**	9266	**C5783**
8218	**C1158**	8457	**C4067**	8760	**C2534**	9268	**C1165**
8219	**C1188**	8458	**C4073**	8761	**C2514**	9269	**C1164**
8221	**C1135**	8459	**C4076**	8762	**C2524**	9271	**C8012**
8227	**C8010**	8461	**C2830**	8763	**C1333**	9272	**C8002**
8228	**C5760**	8465	**C2420**	8767	**C6035**	9274	**C1133**
8232	**C5031**	8466	**C2412**	8768	**C6036**	9275	**C5780**
8233	**C5027**	8467	**C2421**	8769	**C6045**	9291	**C5770**
8237	**C1154**	8468	**C2423**	8770	**C2535**	9292	**C5029**
8240	**C1166**	8469	**C2422**	8771	**C2526**	9302	**C1670**
8241	**C1106**	8471	**C2405**	8772	**C2528**	9305	**C1676**
8254	**C1163**	8473	**C2409**	8773	**C6046**	9306	**C1671**
8259	**C1178**	8477	**C2410**	8774	**C6042**	9309	**C1672**
8261	**C1160**	8486	**C2754**	8775	**C6043**	9310	**C1174**
8262	**C1155**	8487	**C2755**	8776	**C6044**	9311	**C1172**
8263	**C1106**	8488	**C1130**	8777	**C6040**	9312	**C0460**
8267	**C1176**	8489	**C2404**	8778	**C6041**	9314	**C0458**
8279	**C1193**	8500	**C7513**	8780	**C2895**	9315	**C1673**
8281	**C1191**	8502	**C7509**	8782	**C1356**	9316	**C0456**
8302	**C0650**	8504	**C7503**	8784	**C4085**	9319	**C1674**
8303	**C0651**	8520	**C7610**	8786	**C1345**	9320	**C0452**
8304	**C0652**	8521	**C7608**	8790	**C2892**	9322	**C0450**
8305	**C0653**	8522	**C7606**	8791	**C2768**	9327	**C1675**
8306	**C0654**	8523	**C7604**	8898	**C1318**	9328	**C0570**
8307	**C0655**	8524	**C7602**	8899	**C1321**	9329	**C0571**
8308	**C0656**	8525	**C7600**	8916	**C2105**	9330	**C0572**
8310	**C0658**	8527	**C7611**	8917	**C2104**	9331	**C0573**
8312	**C0660**	8529	**C7605**	8918	**C2103**	9332	**C0574**
8315	**C0661**	8530	**C7603**	8919	**C2102**	9333	**C0575**
8318	**C0662**	8538	**C7601**	8920	**C2101**	9363	**C0451**
8325	**C0663**	8618	**C2537**	9011	**C5034**	9364	**C0453**
8332	**C0620**	8619	**C2424**	9066	**C5804**	9365	**C0455**
8333	**C0621**	8620	**C2425**	9067	**C5844**	9366	**C0457**
8334	**C0622**	8621	**C2426**	9100	**C5840**	9367	**C0459**
8335	**C0623**	8622	**C2427**	9104	**C5782**	9368	**C0584**
8336	**C0624**	8623	**C2428**	9105	**C5842**	9369	**C0585**
8337	**C0625**	8624	**C2429**	9106	**C5834**	9388	**C0586**
8340	**C0628**	8627	**C2430**	9108	**C5832**	9389	**C0587**
8342	**C0630**	8628	**C2431**	9114	**C5774**	9390	**C0588**
8345	**C0631**	8641	**C2513**	9116	**C5775**	9391	**C0589**
8348	**C0632**	8649	**C1360**	9117	**C5802**	9392	**C0590**
8355	**C0633**	8690	**C6103**	9141	**C1192**	9396	**C1359**
8412	**C1302**	8691	**C6106**	9155	**C1343**	9397	**C1226**
8416	**C1375**	8692	**C6109**	9156	**C6118**	9398	**C1227**
8417	**C1355**	8718	**C2539**	9157	**C6119**	9406	**C1350**
8418	**C1313**	8719	**C2536**	9158	**C4016**	9407	**C0431**

This cross reference guide should be used in conjunction with the product information in this catalog. It should be used for suggested alternative items which are functionally equal. Constructional differences are not indicated. BICCGeneral is not responsible for variances due to competitor and industry constructional changes or agency updates.

Belden-to-BICCGeneral Carol® Brand Cross Reference Index

BELDEN PART NO.	BICCG/CAROL PART NO.	BELDEN PART NO.	BICCG/CAROL PART NO.	BELDEN PART NO.	BICCG/CAROL PART NO.	BELDEN PART NO.	BICCG/CAROL PART NO.
9408	**C0433**	9556	**C0563**	9746	**C6015**	9910	**C2107**
9409	**C0435**	9559	**C0564**	9747	**C6023**	9912	**C2106**
9410	**C0437**	9562	**C4430**	9748	**C6027**	9913	**C1180**
9411	**C0439**	9563	**C0565**	9749	**C6028**	9914	**C1199**
9412	**C0441**	9565	**C0566**	9750	**C6113**	9916	**C2065**
9418	**C2543**	9566	**C4431**	9751	**C6114**	9918	**C2064**
9423	**C4070**	9570	**C4432**	9752	**C6115**	9919	**C2040**
9430	**C4088**	9571	**C0403**	9755	**C6116**	9921	**C2016**
9431	**C4075**	9572	**C0424**	9767	**C6034**	9923	**C2015**
9432	**C4077**	9574	**C0417**	9768	**C6059**	9924	**C2100**
9433	**C4078**	9575	**C0427**	9769	**C6060**	9925	**C0680**
9434	**C4079**	9576	**C0400**	9770	**C2517**	9926	**C2014**
9439	**C6356**	9577	**C0465**	9773	**C6047**	9927	**C0681**
9445	**C6355**	9584	**C0466**	9774	**C6048**	9928	**C2013**
9451	**C2520**	9585	**C4433**	9775	**C6049**	9929	**C0682**
9452	**C1228**	9597	**C0422**	9776	**C6050**	9931	**C0683**
9455	**C6357**	9598	**C0467**	9777	**C6051**	9932	**C0684**
9457	**C6360**	9608	**C0951**	9791	**C0533**	9933	**C0685**
9458	**C6358**	9609	**C0952**	9802	**C2509**	9934	**C0686**
9460	**C2521**	9610	**C0953**	9803	**C2510**	9935	**C0687**
9461	**C2518**	9611	**C0954**	9804	**C0804**	9936	**C0688**
9463	**C8001**	9612	**C0955**	9805	**C0805**	9937	**C0689**
9464	**C2519**	9613	**C0956**	9806	**C0806**	9938	**C0690**
9491	**C0432**	9614	**C0957**	9807	**C0807**	9939	**C0971**
9492	**C0434**	9615	**C0958**	9808	**C0808**	9940	**C0972**
9493	**C0436**	9616	**C0959**	9809	**C0809**	9941	**C0973**
9494	**C0438**	9617	**C0961**	9812	**C0812**	9942	**C0974**
9495	**C0440**	9618	**C0963**	9813	**C0813**	9943	**C0975**
9501	**C0600**	9619	**C0965**	9814	**C0814**	9944	**C0976**
9502	**C0601**	9620	**C2434**	9815	**C8011**	9945	**C0977**
9503	**C0602**	9621	**C2435**	9819	**C0819**	9946	**C0978**
9504	**C0603**	9622	**C2436**	9825	**C0825**	9947	**C0979**
9505	**C0604**	9623	**C2437**	9829	**C0829**	9948	**C0981**
9506	**C0605**	9626	**C2433**	9830	**C0830**	9949	**C0983**
9507	**C0606**	9637	**C0948**	9831	**C0831**	9950	**C0985**
9508	**C0607**	9641	**C0995**	9832	**C0832**	9975	**C2114**
9509	**C0608**	9659	**C1103**	9833	**C0833**	9976	**C2122**
9510	**C0609**	9680	**C0615**	9834	**C0834**	9977	**C2123**
9512	**C0550**	9681	**C0616**	9835	**C0835**	9981	**C2120**
9513	**C0551**	9682	**C0617**	9836	**C0836**	9983	**C2111**
9514	**C0552**	9683	**C0618**	9837	**C0837**	9984	**C2110**
9515	**C0610**	9684	**C0619**	9838	**C0838**	9985	**C2126**
9516	**C0553**	9685	**C1329**	9841	**C4841**	9990	**C6065**
9519	**C0611**	9696	**C8006**	9842	**C4842**	9991	**C6066**
9520	**C0554**	9708	**C1357**	9843	**C4843**	9992	**C6067**
9521	**C0555**	9712	**C1362**	9855	**C8004**	9999	**C8033**
9524	**C0556**	9716	**C1358**	9860	**C8013**	82241	**C3500**
9525	**C0612**	9717	**C1361**	9862	**C1162**	82248	**C3521**
9533	**C0741**	9718	**C1363**	9863	**C8007**	82262	**C3520**
9534	**C0742**	9721	**C2443**	9873	**C6052**	82907	**C3579**
9535	**C0753**	9728	**C0912**	9874	**C6053**	1032A	**C0454**
9536	**C0743**	9729	**C0910**	9875	**C6054**	1186A	**C5784**
9537	**C0754**	9730	**C0911**	9876	**C6055**	1223A	**C5812**
9538	**C0744**	9731	**C0913**	9877	**C6056**	1227A	**2133009**
9539	**C0755**	9732	**C0914**	9879	**C6058**	1228A	**2133013**
9540	**C0745**	9733	**C0915**	9880	**C0990**	1229A	**2133017**
9541	**C0746**	9734	**C0916**	9883	**C6061**	1523A	**C5039**
9542	**C0747**	9735	**C0917**	9886	**C6062**	1525A	**C5043**
9543	**C0748**	9736	**C0918**	9888	**C5030**	1530A	**C5776**
9544	**C0749**	9737	**C0919**	9890	**C2511**	1583A	**2133200**
9545	**C0750**	9738	**C0920**	9891	**C0991**	1588A	**2133198**
9546	**C0751**	9740	**C6101**	9892	**C0992**	1613A	**C5812**
9550	**C0613**	9741	**C6110**	9893	**C0993**	1617A	**C5044**
9552	**C0560**	9742	**C6111**	9894	**C2512**	1694A	**C5814**
9553	**C0561**	9743	**C6112**	9898	**C0994**	1829A	**C5820**
9554	**C0562**	9744	**C6010**	9899	**C1320**	1833A	**C5857**
9555	**C8005**	9745	**C6014**	9907	**C5779**	5000 F E	**E2062S**

This cross reference guide should be used in conjunction with the product information in this catalog. It should be used for suggested alternative items which are functionally equal. Constructional differences are not indicated. BICCGeneral is not responsible for variances due to competitor and industry constructional changes or agency updates.

Belden-to-BICCGeneral Carol® Brand Cross Reference Index

BELDEN PART NO.	BICCG/CAROL PART NO.	BELDEN PART NO.	BICCG/CAROL PART NO.
5000 U E	**E1062S**	6020 U L	**E3532S**
5002 U E	**E1064S**	6100 F E	**E2252S**
5020 F L	**E2542S**	6100 U E	**E3052S**
5020 U L	**E1532S**	6100 U F	**C3128**
5100 F E	**E2052S**	6102 U E	**E3054S**
5100 U E	**E1052S**	6120 F L	**E3622S**
5102 U E	**E1054S**	6120 U L	**E3522S**
5120 F L	**E2532S**	6122 U L	**E3524S**
5120 L L	**E2406S**	6200 F E	**E2242S**
5120 U L	**E1522S**	6200 U E	**E3042S**
5122 F L	**E2534S**	6200 U E	**C3127**
5122 U L	**E1524S**	6201 F E	**E2243S**
5200 F E	**E2042S**	6201 U E	**E3043S**
5200 U E	**E1042S**	6202 F E	**E2244S**
5202 U E	**E1044S**	6202 U E	**E3044S**
5220 F L	**E2522S**	6220 F L	**E3612S**
5220 L L	**E2404S**	6220 U L	**E3512S**
5220 U L	**E1512S**	6222 F L	**E3614S**
5222 F L	**E2524S**	6222 U L	**E3514S**
5222 U L	**E1514S**	6300 F E	**E2202S**
5300 F E	**E2032S**	6300 U E	**E3032S**
5300 U E	**E1032S**	6301 F E	**E2203S**
5301 F E	**E2033S**	6301 U E	**E3033S**
5301 U E	**E1033S**	6301 U E	**C3120**
5302 F E	**E2034S**	6302 F E	**E2204S**
5302 U E	**E1034S**	6302 U E	**E3034S**
5304 F E	**E2036S**	6302 U E	**C3113**
5304 U E	**E1036S**	6304 F E	**E2206S**
5306 U E	**E1038S**	6304 U E	**E3036S**
5308 U E	**E1040S**	6304 U E	**C3121**
5309 U E	**E1041S**	6306 U E	**E3038S**
5320 F E	**E2030S**	6306 U E	**C3122**
5320 F L	**E2502S**	6320 F E	**E2200S**
5320 L L	**E2402S**	6320 F L	**E3602S**
5320 U E	**E1030S**	6320 U E	**E3030S**
5320 U L	**E1502S**	6320 U L	**E3502S**
5321 F L	**E2503S**	6321 F L	**E3603S**
5321 U L	**E1503S**	6321 U L	**E3503S**
5322 F L	**E2504S**	6322 F L	**E3604S**
5322 U L	**E1504S**	6322 U L	**E3504S**
5324 U L	**E1506S**	6324 U L	**E3506S**
5400 F E	**E2022S**	6400 F E	**E2122S**
5400 U E	**E1022S**	6400 U E	**E3022S**
5401 F E	**E2023S**	6401 F E	**E2123S**
5401 U E	**E1023S**	6401 U E	**E3023S**
5402 F E	**E2024S**	6402 F E	**E2124S**
5402 U E	**E1024S**	6402 U E	**E3024S**
5500 F E	**E2002S**	6500 F E	**E2102S**
5500 U E	**E1002S**	6500 U E	**E3002S**
5501 F E	**E2003S**	6501 F E	**E2103S**
5501 U E	**E1003S**	6501 U E	**E3003S**
5502 F E	**E2004S**	6502 F E	**E2104S**
5502 U E	**E1004S**	6502 U E	**E3004S**
5504 F E	**E2006S**	6502 U E	**C3116**
5504 U E	**E1006S**	6504 F E	**E2106S**
5506 F E	**E2008S**	6504 U E	**E3006S**
5506 U E	**E1008S**	6506 F E	**E2108S**
5508 F E	**E2010S**	6506 U E	**E3008S**
5508 U E	**E1010S**	6520 F E	**E2100S**
5509 F E	**E2012S**	6520 U E	**E3000S**
5509 U E	**E1012S**	6522 U E	**E3001S**
5520 F E	**E2000S**	8281B	**C5816**
5520 U E	**E1000S**		
5522 U E	**E1001S**		
5522 U L	**E1484S**		
6000 U C	**C3129**		
6020 F L	**E3632S**		

This cross reference guide should be used in conjunction with the product information in this catalog. It should be used for suggested alternative items which are functionally equal. Constructional differences are not indicated. BICCGeneral is not responsible for variances due to competitor and industry constructional changes or agency updates.

West Penn-to-BICCGeneral Carol® Brand Cross Reference Index

WEST PENN PART NO.	BICCG/CAROL PART NO.	WEST PENN PART NO.	BICCG/CAROL PART NO.	WEST PENN PART NO.	BICCG/CAROL PART NO.
103	**C1360**	986	**E1508S**	253270B	**E2106S**
104	**C1357**	990	**E1512S**	253271B	**E2108S**
105	**C1358**	991	**E2522S**	60975B	**E3602S**
117	**C2103**	992	**E1514S**	60980B	**E3502S**
118	**C2104**	993	**E2524S**	60990B	**E3612S**
119	**C2105**	994	**E1522S**	60991B	**E3512S**
120	**C2106**	995	**E2532S**	60993B	**E3522S**
220	**E1000S**	998	**E1532S**	841S	**C5777**
221	**E1002S**	999	**E2542S**	D291	**C2514**
222	**E1022S**	1083	**E2484S**	D292	**C2524**
224	**E1032S**	2814	**C8025**	D293	**C2534**
225	**E1042S**	3011	**E2024S**	D294	**C2536**
226	**E1052S**	3021	**E2036S**	D303	**C2535**
227	**C2410**	3241	**E2004S**	D431	**C6040**
227	**E1062S**	3244	**E2034S**	D432	**C6041**
228	**E1030S**	3245	**E2044S**	D510	**C1353**
231	**E1003S**	3270	**E2006S**	P806	**C5838**
232	**E1023S**	3271	**E2008S**	PLT291	**C0450**
234	**E1033S**	3272	**E2010S**	PLT293	**C0454**
235	**E1043S**	3273	**E2012S**	Q841	**C5785**
240	**E1001S**	3283	**E2041S**	Q843	**C5784**
241	**E1004S**	5900	**C5782**		
242	**E1024S**	5915	**C5844**		
244	**E1034S**	5930	**C5832**		
245	**E1044S**	6140	**C5804**		
246	**E1054S**	6150	**C5826**		
248	**E1064S**	6170	**C5776**		
270	**E1006S**	7100	**C5851**		
271	**E1008S**	7120	**C5853**		
272	**E1010S**	7130	**C5856**		
273	**E1012S**	25862	**C3579**		
283	**E1041S**	50221	**E3002S**		
290	**E2000S**	50224	**E3032S**		
291	**E2002S**	50231	**E3003S**		
292	**E2022S**	50234	**E3033S**		
293	**E2032S**	50241	**E3004S**		
294	**E2042S**	50244	**E3034S**		
295	**E2052S**	50291	**E2102S**		
296	**E2062S**	50293	**E2202S**		
301	**E2003S**	50303	**E2203S**		
302	**E2023S**	60975	**E3602S**		
303	**E2033S**	60977	**E3604S**		
304	**E2043S**	60980	**E3502S**		
452	**C2516**	60982	**E3504S**		
801	**C1160**	60992	**E3622S**		
804	**C1104**	60994	**E3632S**		
810	**C1198**	60995	**E3532S**		
811	**C5025**	256350	**C3521**		
812	**C1188**	503244	**E2204S**		
816	**C1103**	25221B	**E3002S**		
820	**C1164**	25222B	**E3022S**		
821	**C5029**	25224B	**E3032S**		
834	**C1112**	25225B	**E3042S**		
840	**C5770**	25226B	**E3052S**		
841	**C5776**	25227B	**E3062S**		
842	**C5775**	25234B	**E3033S**		
845	**C5780**	25241B	**E3004S**		
862	**C5779**	25242B	**E3024S**		
970	**E2402S**	25244B	**E3034S**		
971	**E2404S**	25270B	**E3006S**		
972	**E2406S**	25291B	**E2102S**		
975	**E2502S**	25292B	**E2122S**		
976	**E2503S**	25293B	**E2202S**		
977	**E2504S**	25294B	**E2242S**		
980	**E1502S**	25301B	**E2103S**		
982	**E1504S**	253241B	**E2104S**		
984	**E1506S**	253244B	**E2204S**		

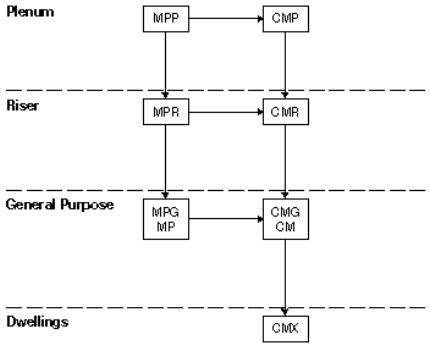
NEC Substitution Chart

Communication wire and cable for premise installations in accordance with Article 800, and other applicable parts of the National Electrical Code (NEC), latest issue. Communication wire and cables for Canada are in accordance with the harmonized Canadian Standard Association C22.2 No. 214, Underwriters Laboratories UL 444, latest issue.

FIRE RESISTANCE LEVEL	TEST REQUIREMENT	NEC ARTICLE			
		800	725	760	820
(Highest) Plenum Cables	UL-910 (Steiner tunnel) CSA-CMP (Steiner tunnel)	MPP CMP	CL3P CL2P	FPLP	CATVP
Riser Cables Multiple Floors	UL-1666 (Vertical Shaft) CSA-CMG (Vertical Tray)	MPR	CL3R CL2R	FPLR	CATVR
General Purpose Cables	UL-1581 (Vertical Tray)	MPG CMG	CL3	FPL	CATV
(Lowest) Residential Cables Restricted Use	CSA-CMG (Vertical Tray) UL-1581 VW-1	CMX	CL2 CL3X		CATVX

Notes: 1.Cables with a higher fire resistance level may be substituted for those with a lower fire resistance level.
2.Non-fire rated outside plant telephone cables may not run outside of a rigid metal conduit more than 50 feet from the point of entrance into a building.
3.Cables rated CMG or CM may be used in runs penetrating one floor. (NEC 800-53)

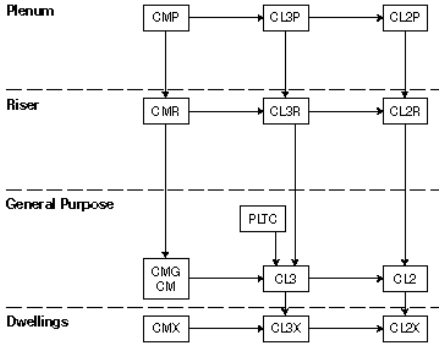
Figure 800-53, Cable Substitution Hierarchy



Type CM — Communications cables.
Type MP — Multipurpose cables

A → B Cable A shall be permitted to be used in place of Cable B

Figure 725-61, Cable Substitution Hierarchy



Type CM — Communications wires and cables.
Type CL2 and CL3 — Class 2 and Class 3 remote-control, signaling and power-limited cables
Type PLTC — Power-limited tray cable

A → B Cable A shall be permitted to be used in place of Cable B

Article 800

Table 800-53. Cable Uses and Permitted Substitutions

CABLE TYPE	USE	REFERENCES	PERMITTED SUBSTITUTIONS
CMP	Communications plenum cable	800-53(a)	MPP
CMR	Communications riser cable	800-53(b)	MPP, CMP, MPR
CMG, CM	Communications general purpose cable	800-53(d)	MPP, CMP, MPR, CMR, MPG, MP
CMX	Communications cable, limited use	800-53(d)	MPP, CMP, MPR, CMR, MPG, MP, CMG, CM

Note: See Figure 800-53, Cable Substitution Hierarchy

Article 725

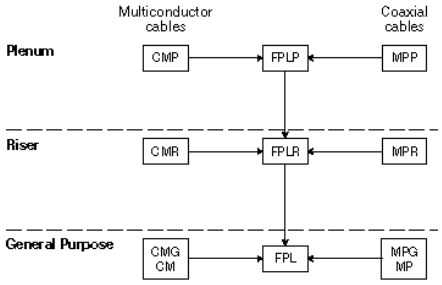
Table 725-61. Cable Uses and Permitted Substitutions

CABLE TYPE	USE	REFERENCES	PERMITTED SUBSTITUTIONS
CL3P	Class 3 plenum cable	725-61(a)	CMP
CL2P	Class 2 plenum cable	725-61(a)	CMP, CL3P
CL3R	Class 3 riser cable	725-61(b)	CMP, CL3P, CMR
CL2R	Class 2 riser cable	725-61(b)	CMP, CL3P, CL2P, CMR, CL3R
PLTC	Power-limited tray cable	725-61(c) and (d)	
CL3	Class 3 cable	725-61(b), (e) and (f)	CMP, CL3P, CMR, CL3R CMG, CM, PLTC
CL2	Class 2 cable	725-61(b), (c) and (f)	CMP, CL3P, CL2P, CMR, CL3R, CL2R, CMG, CM, PLTC, CL3
CL3X	Class 3 cable, limited use	725-61(b) and (e)	CMP, CL3P, CMR, CL3R, CMG, CM, PLTC, CL3, CMX
CL2X	Class 2 cable, limited use	725-61(b) and (e)	CMP, CL3P, CL2P, CMR, CL3R, CL2R, CMG, CM, PLTC, CL3, CL2, CMX, CL3X

Note: See Figure 725-61, Cable Substitution Hierarchy

NEC Substitution Chart

Figure 760-61, Cable Substitution Hierarchy



Type CM — Communications wires and cables
Type FPL — Power-limited fire alarm cables
Type MP — Multipurpose cables (coaxial cables only)

A → B Cable A shall be permitted to be used in place of Cable B
No. 26 minimum

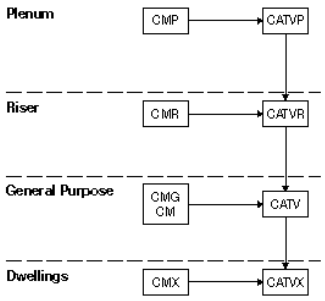
Article 760

Table 760-61. Cable Uses and Permitted Substitutions

CABLE TYPE	USE	REFERENCES	PERMITTED SUBSTITUTIONS	
			MULTICONDUCTOR	COAXIAL
FPLP	Power-limited fire alarm plenum cable	760-61(a)	CMP	MPP
FPLR	Power-limited fire alarm riser cable	760-61(b)	CMP, FPLP, CMR	MPP, MPR
FPL	Power-limited fire alarm cable	760-61(c)	CMP, FPLP, CMR, FPLR, CMG, CM	MPP, MPR, MPG, MP

Note: See Figure 760-61, Cable Substitution Hierarchy

Figure 820-53, Cable Substitution Hierarchy



Type CATV — Community antenna television cables
Type CM — Communications cables

A → B Coaxial Cable A shall be permitted to be used in place of Coaxial Cable B

Article 820

Table 820-53. Coaxial Cable Uses and Permitted Substitutions

CABLE TYPE	USE	REFERENCES	PERMITTED SUBSTITUTIONS
CATVP	Coaxial plenum cable	820-53(a)	CMP
CATVR	Coaxial riser cable	820-53(b)	CATVP , CMP, CMR
CATV	Coaxial general purpose cable	820-53(c)	CATVP, CMP, CATVR, CMR, CMG, CM
CATVX	Coaxial cable, limited use	820-53(c)	CATVP, CMP, CATVR, CMR, CATV, CMG, CM

Note: See Figure 820-53, Cable Substitution Hierarchy

Agency Symbols

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	UL Listed Mark for the United States	CMP Certified Canadian Standard Association	CSA CMP
	UL Listed Mark for Canada	CMG Certified Canadian Standard Association	CSA CMG
	UL Listed Mark for Canada and the United States	CMH Certified Canadian Standard Association	CSA CMH
	UL Recognized Component Mark for the United States		UL 910 Steiner Flame Test
TIA/EIA 568A Cat. 5	IA/EIA 568A Cat. 5		UL Vertical Tray Flame Test
TIA/EIA 568A Cat. 3	TIA/EIA 568A Cat. 3		UL 1666 Riser Flame Test
	California State Fire Marshall		IMSA

Agency Approval Index

Product Description Index

Product Description Index

Product Description Index

Part Number Index

Part Number Index

Notes

Notes

Notes